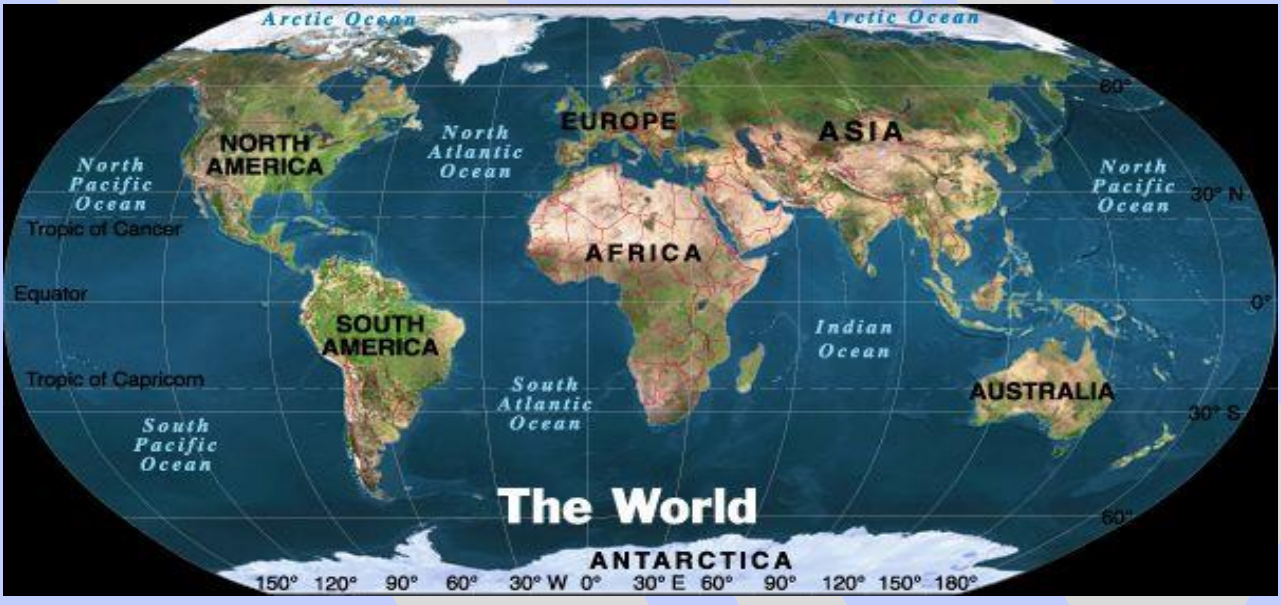
MGT. 205A



Daniel J.B. Mitchell

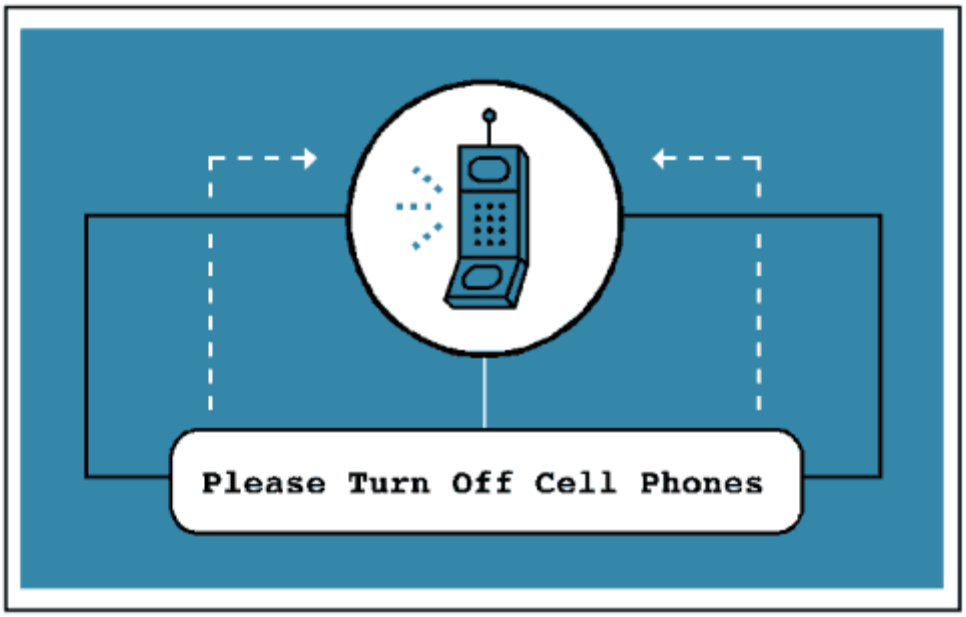
Ho-su Wu Professor

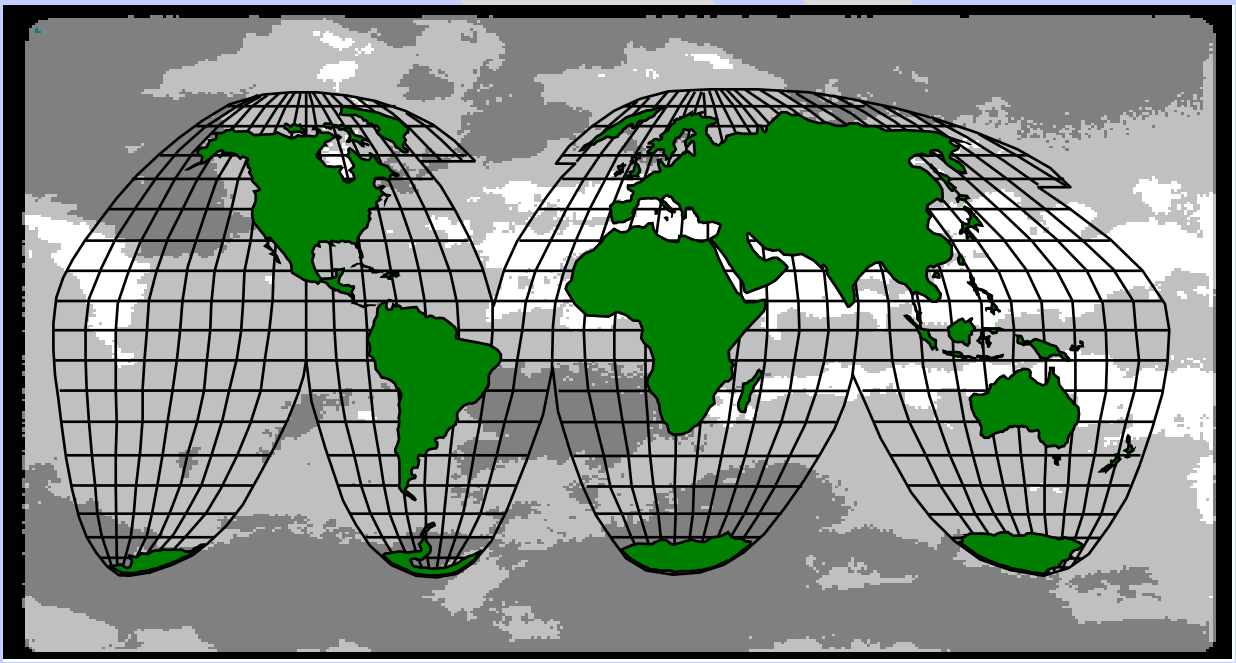
Anderson School

and

School of Public Affairs

Reminder

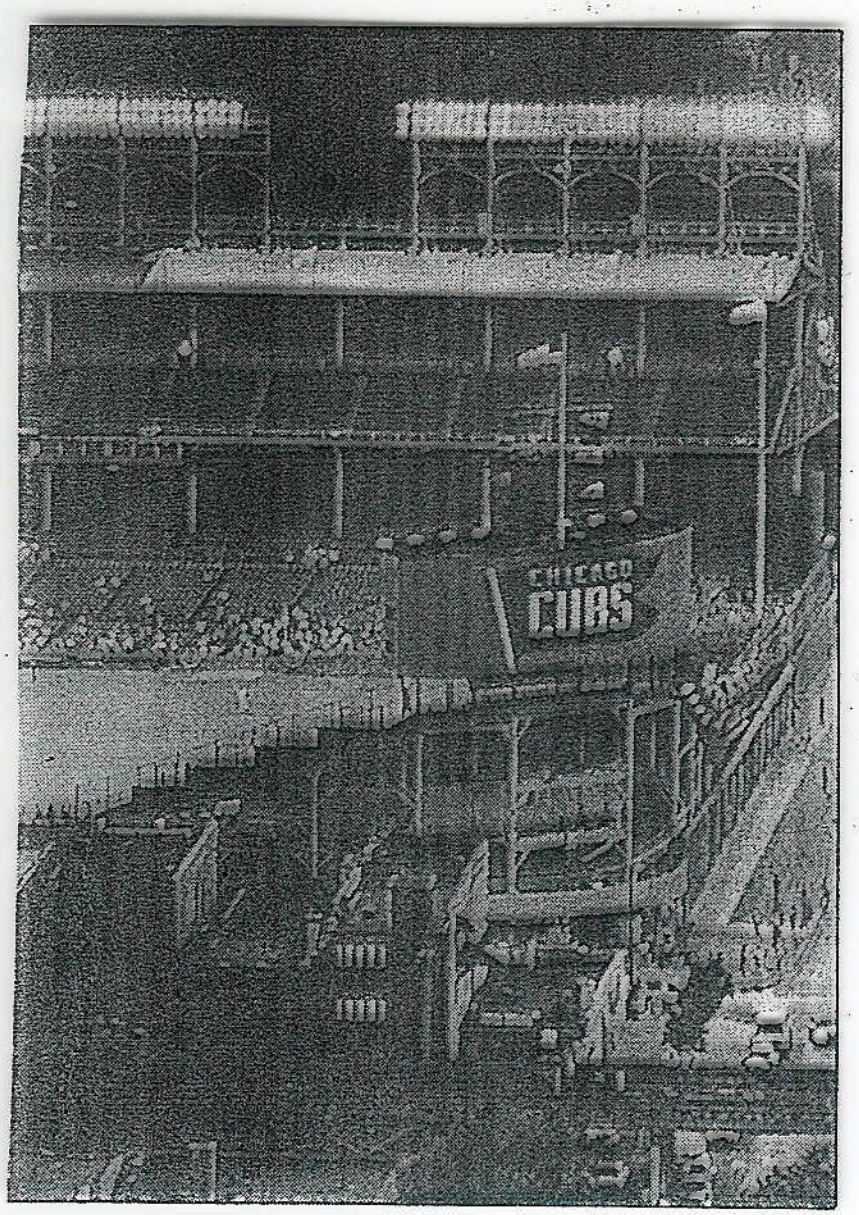




Happy Birthday

Paul Samuelson

May 15, 1915



Mitchell Delivers on Time

Home Run in 7th Against Valenzuela Gives Giants Win

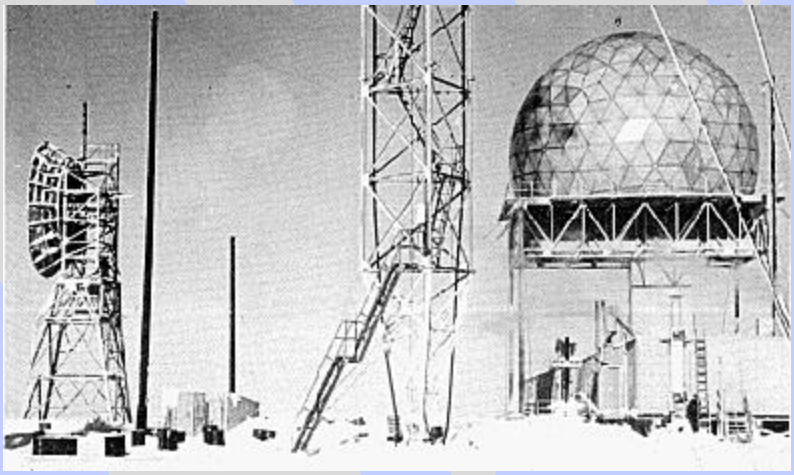
By SAM McMANIS,
Times Staff Writer

SAN FRANCISCO—A swirl of uncertainty, like the wind whipping paper wrappers around Candlestick Park, accompanied Dodger pitcher Fernando Valenzuela to the mound against the San Francisco Giants here Monday night.

Once the owner of a delivery as reliable as Manager Tom Lasorda's postgame caterer, Valenzuela this season has been consistent only in his ability to baffle the Dodgers. Bad starts have outnumbered the good, and no one can predict which will occur based on trends culled from previous outings. They just wait until it unfolds and wish for the best.

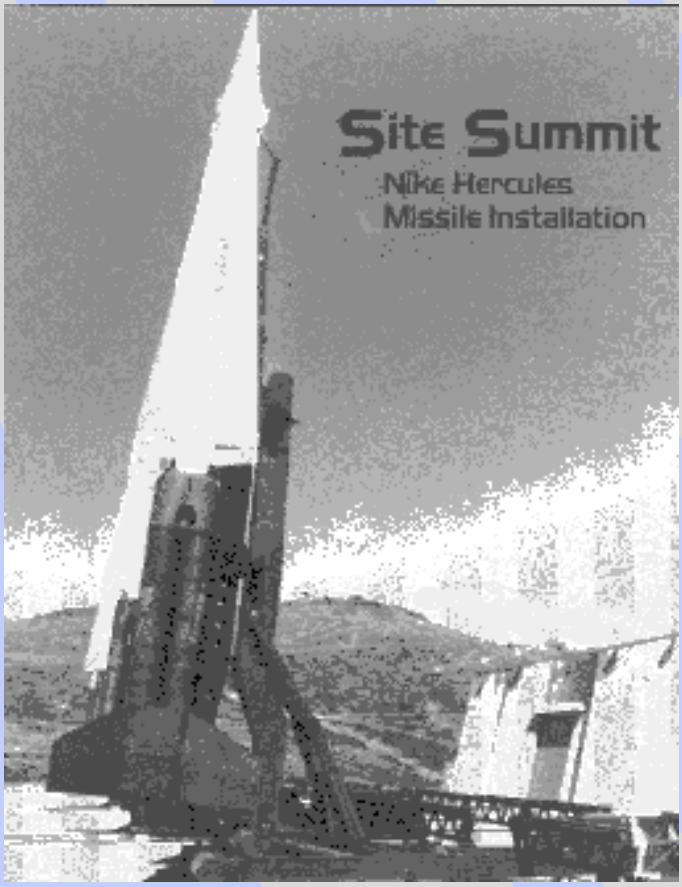
This time, Dodger hopes of getting a good outing *and* a win from Valenzuela, which hasn't happened since June 14, were put to rest in the seventh inning when Kevin Mitchell broke a 1-1 tie with a

What's the DEW Line?



Distant Early Warning

What's the DEW Line?



Distant Early Warning

Exams

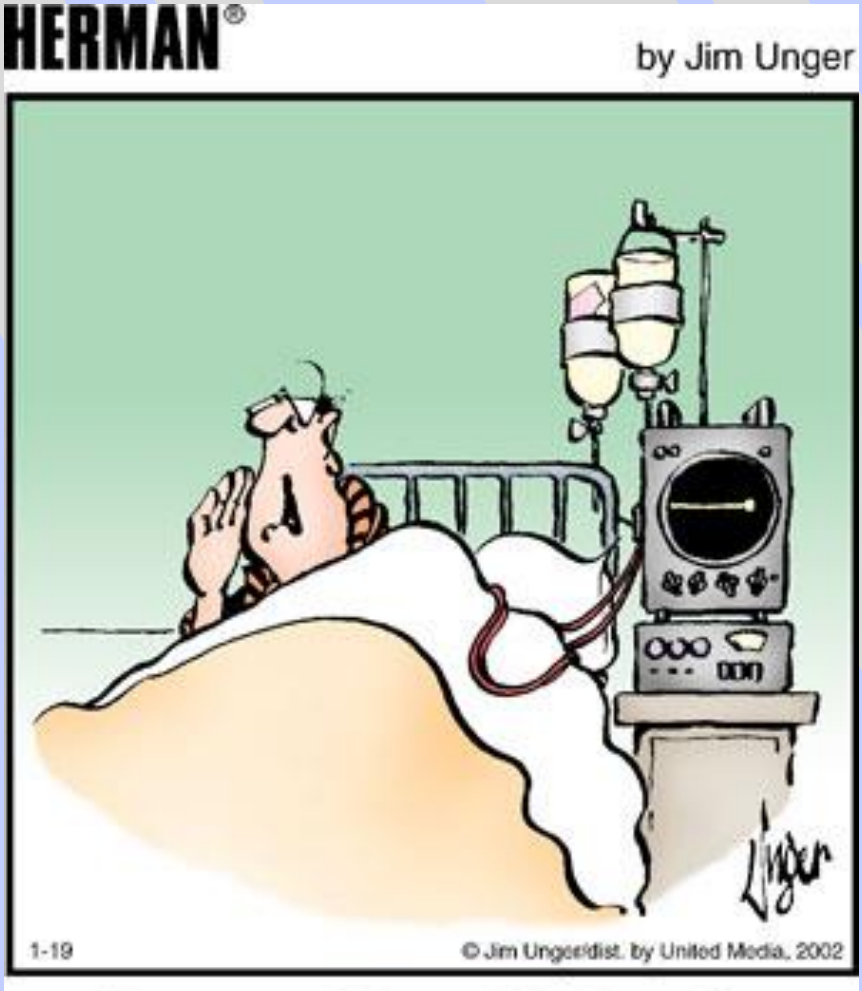
What, me worry?

Exams

Exams

- Go over midterm exam and key
- What did you miss?
  - Terminology?
  - Analytic questions?
  - Textbook?
- Optional Q&A sessions
- Office hours or other

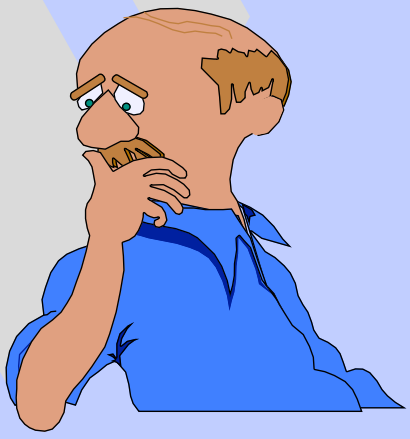
Project



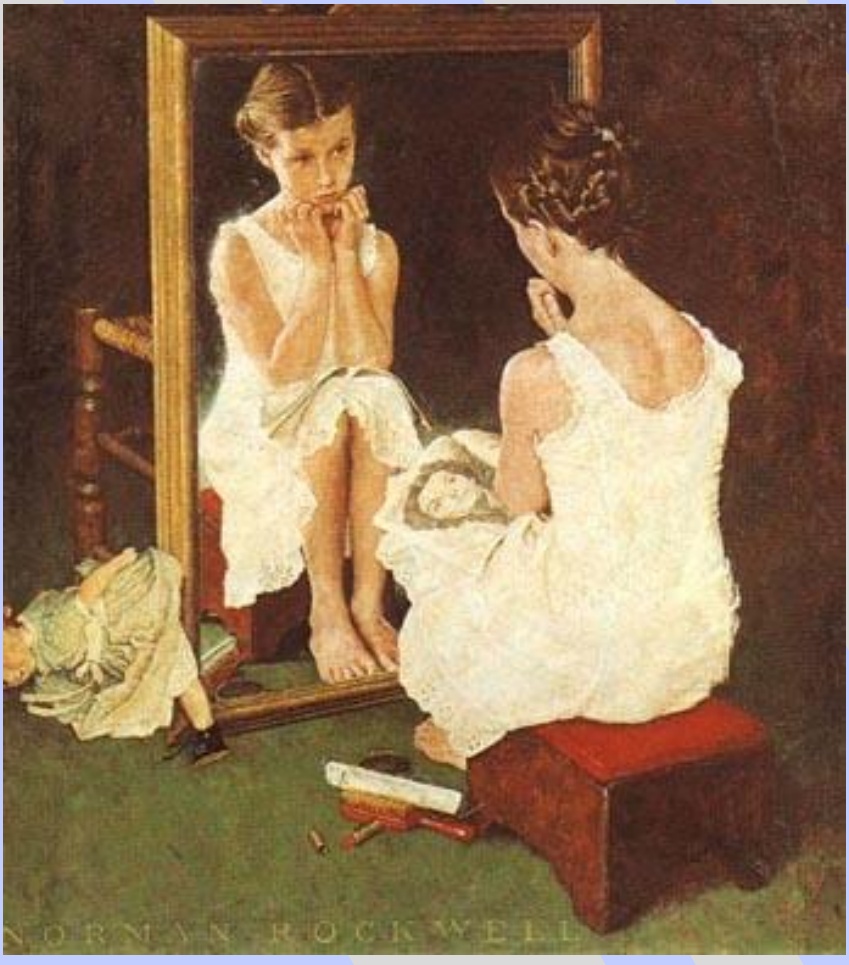
"Excuse me. The machine is making a funny noise and the little light is going in a straight line."

Afterthoughts on Exchange Rates

- **Is it really the case that our supply of exports is exclusively in dollars and is unaffected by devaluation?**
- **What is implied by the notion that a curve is “in” dollars or “in” talents?**
- **Is changing the exchange rate a trick?**



Prices as the Mirror Image of Exchange Rates



One can substitute for the other. If both can vary, can prices predict exchange rates?

The Purchasing-Power-Parity Doctrine
(P-P-P)

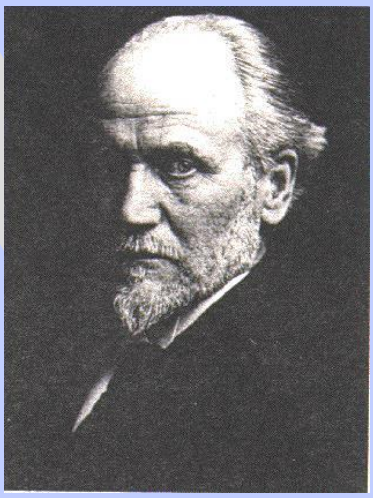
- **Absolute form**

  Prices should be the same everywhere

- **Relative form**

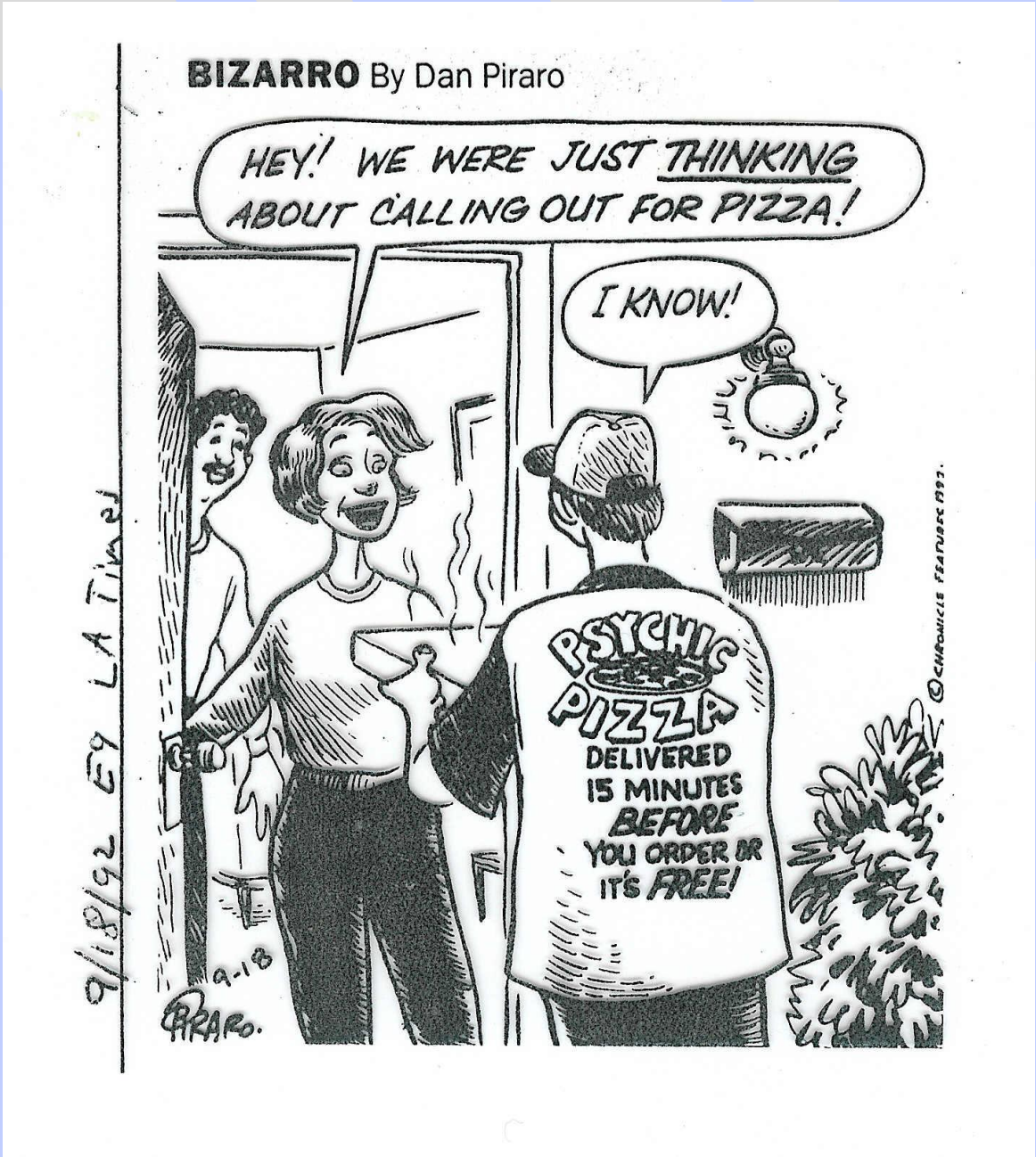
  Price changes should be the same everywhere

- **Empirical evidence on both forms**



Gustav Cassel, 1866-1945

Advantages of Predicting the Future



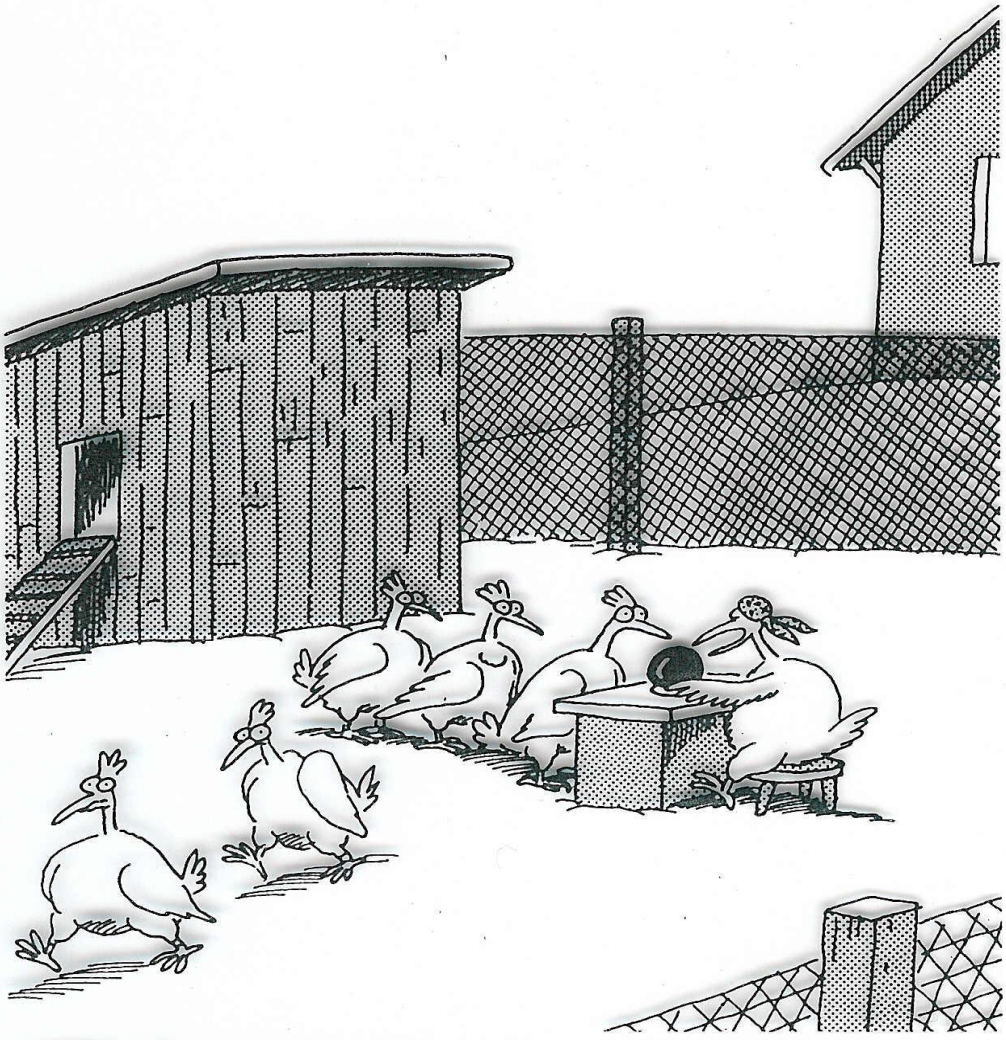
Disadvantages of Predicting the Future?

LA Times 4/26/94 E8

THE FAR SIDE By Gary Larson

Larson 4-26

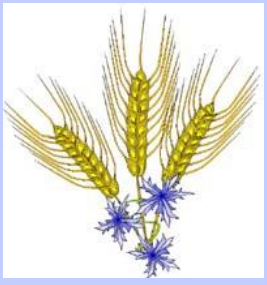
© 1994 FarWorks, Inc./Dist. by Universal Press Syndicate

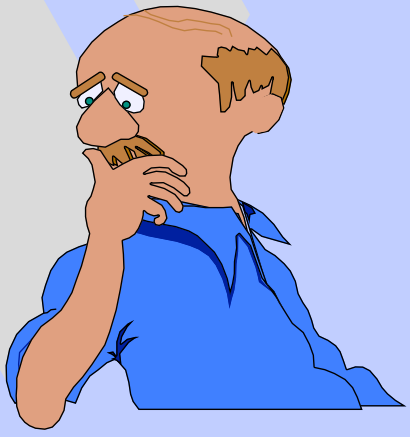


"Whoa! Another bad one! ... I see your severed head lying quietly in the red-stained dirt, a surprised expression still frozen in your lifeless eyes. ... Next."

Some Questions:

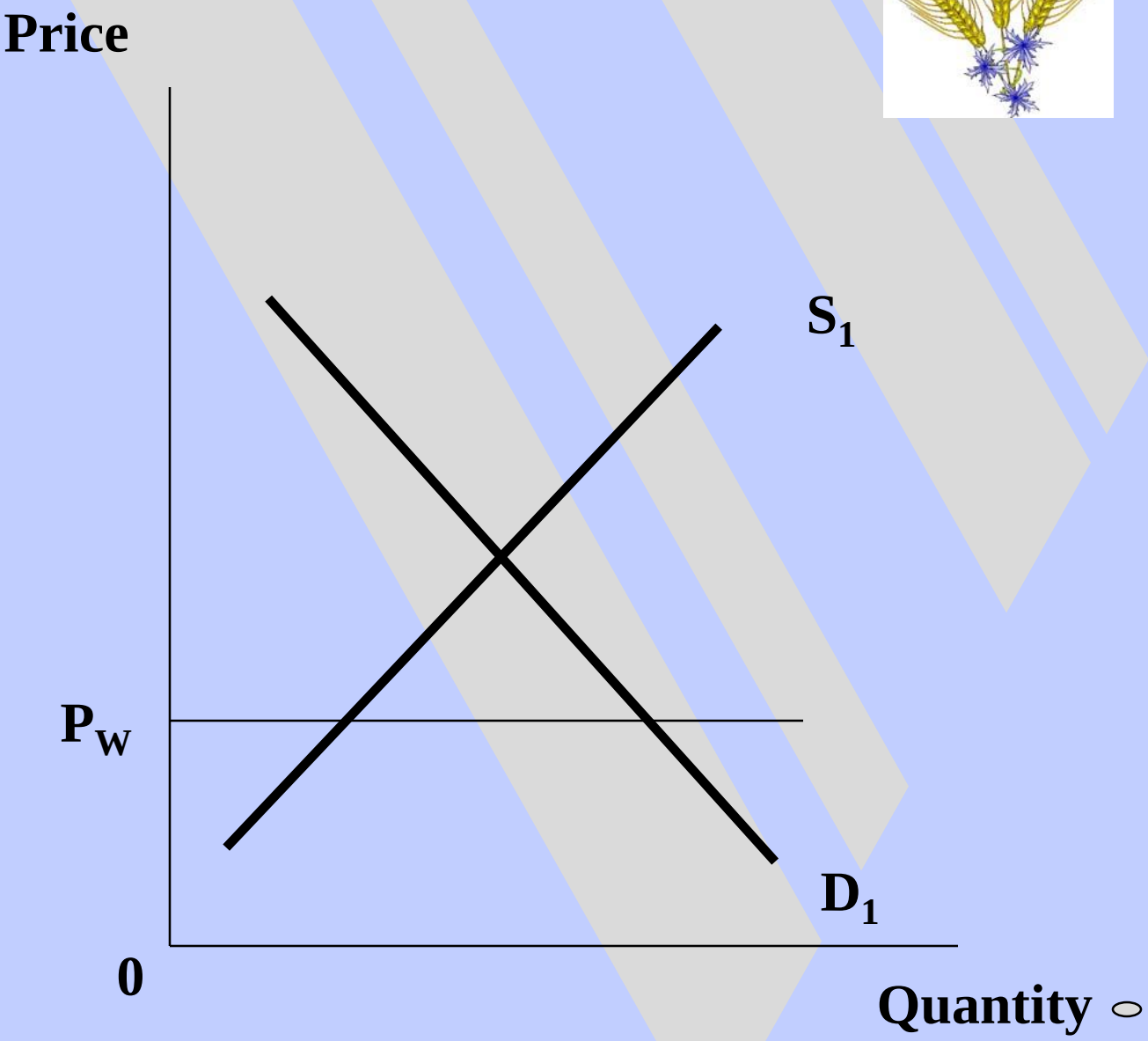
- **Should the price of wheat be the same in the U.S. and the U.K.?**
- **Should the price of a haircut be the same in the U.S. and the U.K.?**
- **What do we learn if haircut prices in the U.K. rise faster than in the U.S.?**





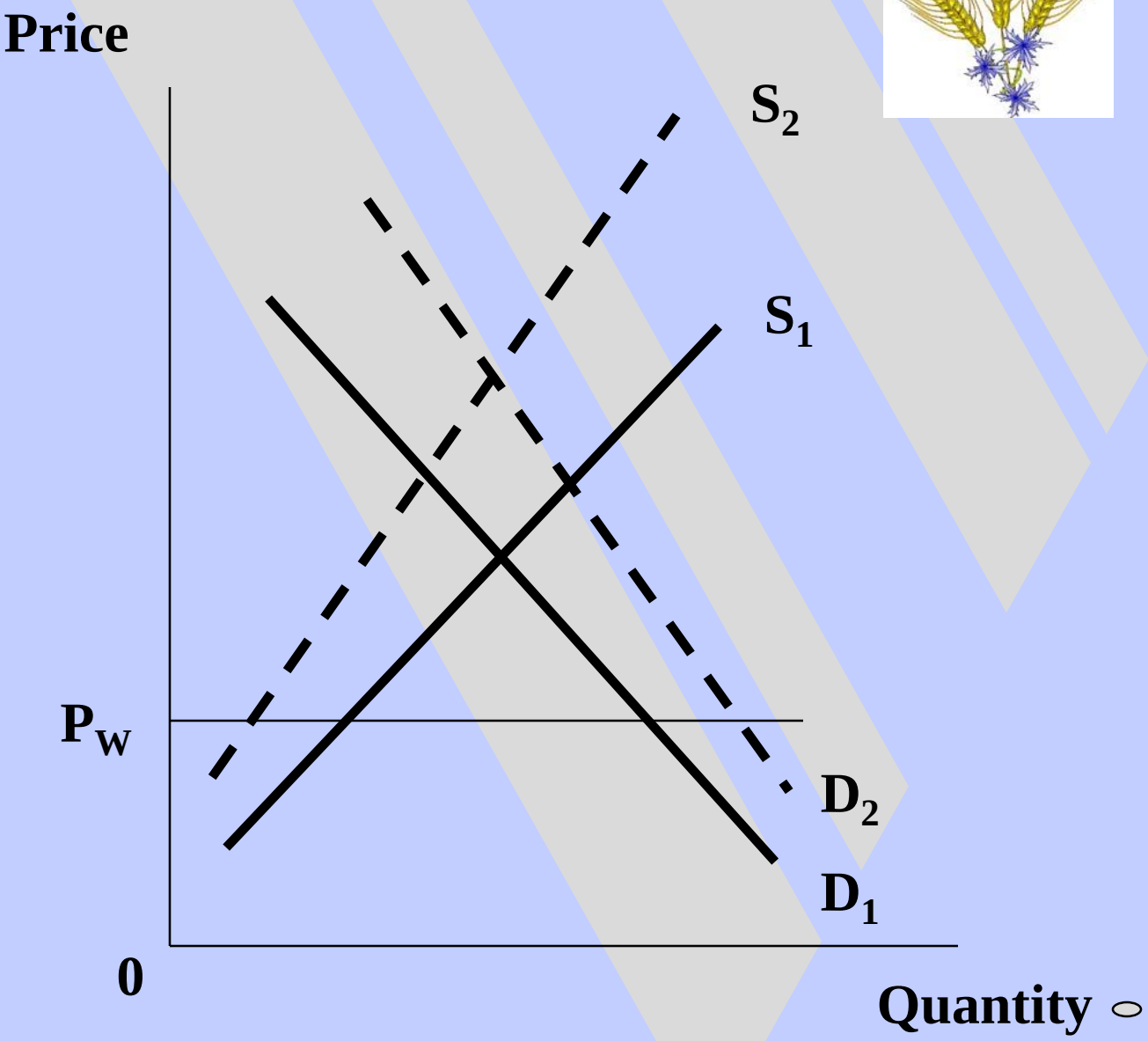
Wheat Market with Domestic Inflation:

Before



Wheat Market with Domestic Inflation:

After



HERMAN®

by Jim Unger

"Sandra, bring me a paper towel."

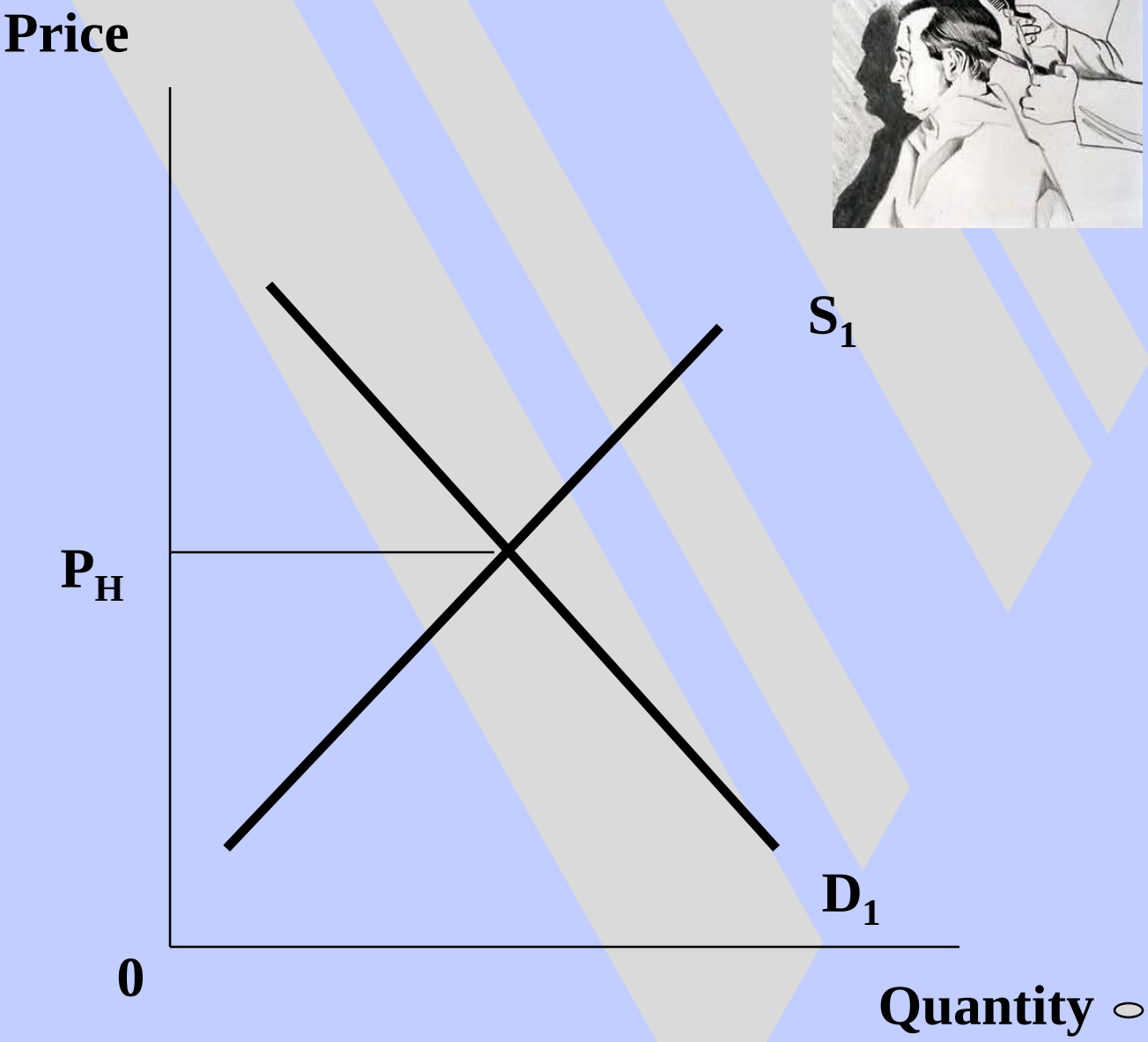
HERMAN®

by Jim Unger

"I like it fairly short and parted in the middle."

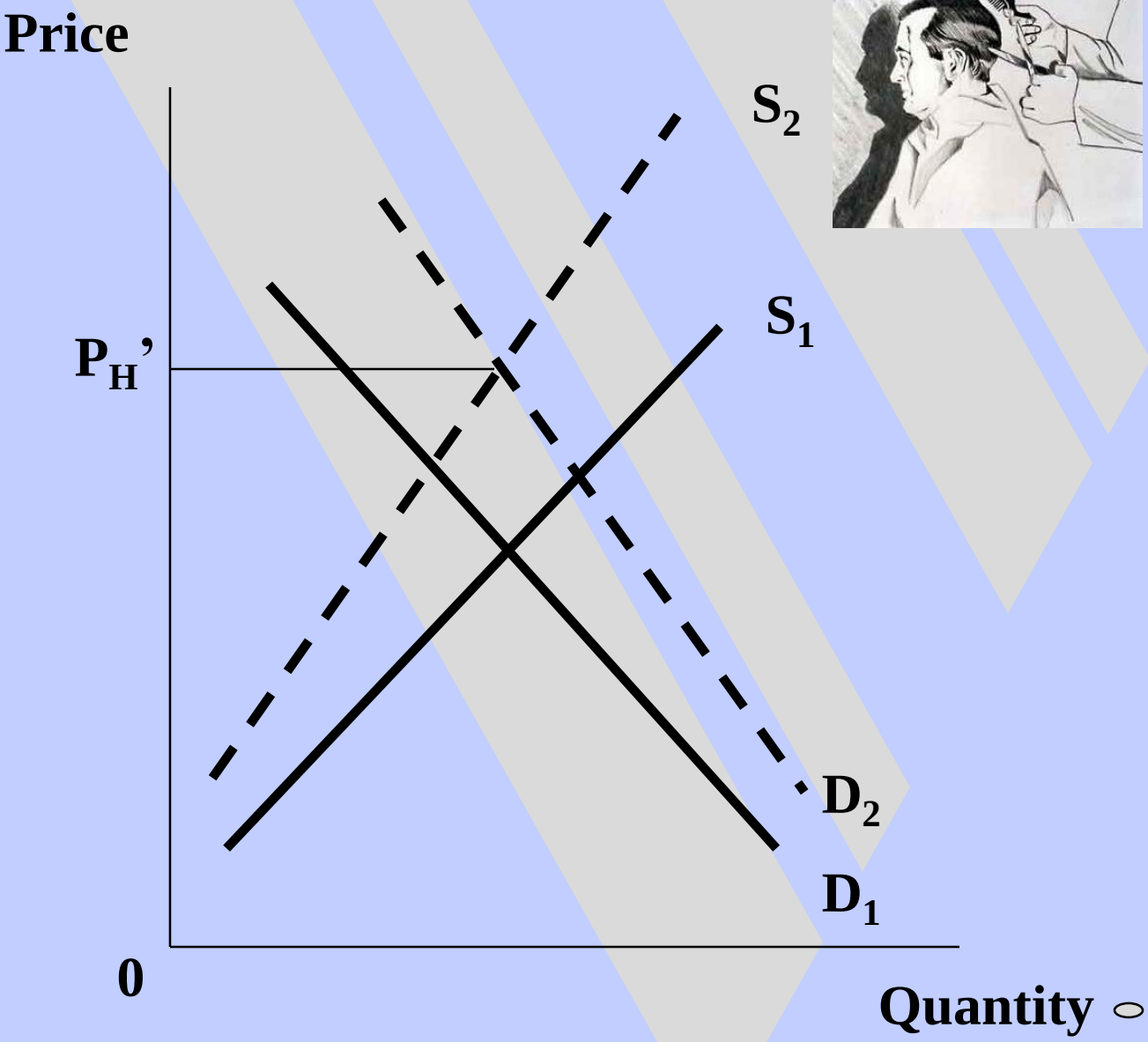
Haircut Market with Domestic Inflation:

Before

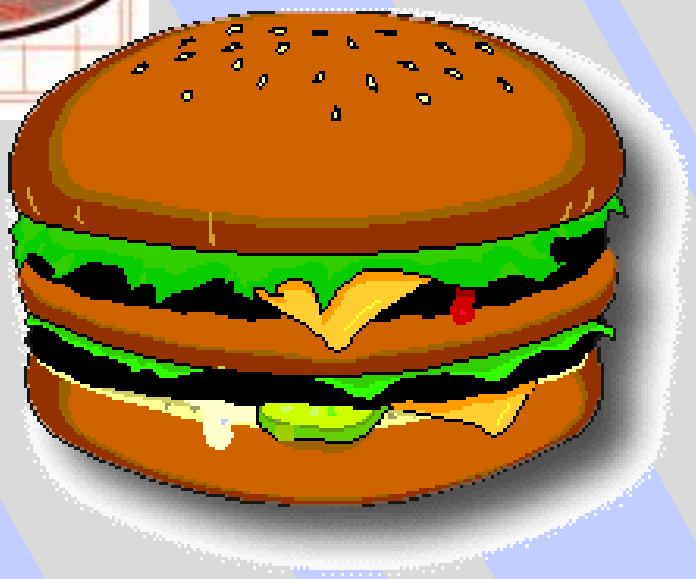


Haircut Market with Domestic Inflation:

After



Hamburger Absolute PPP



Hamburger Absolute PPP

Cash and carry

The hamburger standard

	Big Mac prices in local currency	Big Mac prices in dollars	Implied PPP† of of the	Actual dollar exchange rate July 2nd	Under(-)/over(+) valuation against the dollar, %
United States‡	$3.41	3.41			
Argentina	Peso 8.25	2.67	2.42	3.09	-22
Australia	A$3.45	2.95	1.01	1.17	-14
Brazil	Real 6.90	3.61	2.02	1.91	+6
Britain	£1.99	4.01	1.71§	2.01§	+18
Canada	C$3.88	3.68	1.14	1.05	+8
Chile	Peso 1,565	2.97	459	527	-13
China	Yuan 11.0	1.45	3.23	7.60	-58
Czech Republic	Koruna 52.9	2.51	15.5	21.1	-27
Denmark	Dkr 27.75	5.08	8.14	5.46	+49
Egypt	Pound 9.54	1.68	2.80	5.69	-51
Euro area**	€3.06	4.17	1.12††	1.36††	+22
Hong Kong	HK$12.0	1.54	3.52	7.82	-55
Hungary	Forint 600	3.33	176	180	-2
Indonesia	Rupiah15,900	1.76	4,663	9,015	-48
Japan	¥280	2.29	82.1	122	-33
Malaysia	Ringgit 5.50	1.60	1.61	3.43	-53
Mexico	Peso 29.0	2.69	8.50	10.8	-21
New Zealand	NZ$4.60	3.59	1.35	1.28	+5
Peru	New Sol 9.50	3.00	2.79	3.17	-12
Philippines	Peso 85.0	1.85	24.9	45.9	-46
Poland	Zloty 6.90	2.51	2.02	2.75	-26
Russia	Rouble 52.0	2.03	15.2	25.6	-41
Singapore	S$3.95	2.59	1.16	1.52	-24
South Africa	Rand 15.5	2.22	4.55	6.97	-35
South Korea	Won 2,900	3.14	850	923	-8
Sweden	SKr33.0	4.86	9.68	6.79	+42
Switzerland	SFr6.30	5.20	1.85	1.21	+53
Taiwan	NT$75.0	2.29	22.0	32.8	-33
Thailand	Baht 62.0	1.80	18.2	34.5	-47
Turkey	Lire 4.75	3.66	1.39	1.30	+7
Venezuela	Bolivar 7,400	3.45	2,170	2,147	+1
Colombia	Peso 6,900	3.53	2,023	1,956	+3
Costa Rica	Colon 1,130	2.18	331	519	-36
Estonia	Kroon 30.0	2.61	8.80	11.5	-23
Iceland	Kronur 469	7.61	138	61.7	+123
Latvia	Lats 1.39	2.72	0.41	0.51	-20
Lithuania	Litas 6.60	2.61	1.94	2.53	-24
Norway	Kroner 40.0	6.88	11.7	5.81	+102
Pakistan	Rupee 140	2.32	41.1	60.4	-32
Paraguay	Guarani 10,500	2.04	3,079	5,145	-40
Saudi Arabia	Riyal 9.00	2.40	2.64	3.75	-30
Slovakia	Koruna 61.3	2.49	18.0	24.6	-27
Sri Lanka	Rupee 210	1.89	61.6	111	-45
UAE	Dirhams 10.0	2.72	2.93	3.67	-20
Ukraine	Hryvnia 9.25	1.84	2.71	5.03	-46
Uruguay	Peso 62.0	2.59	18.2	23.9	-24

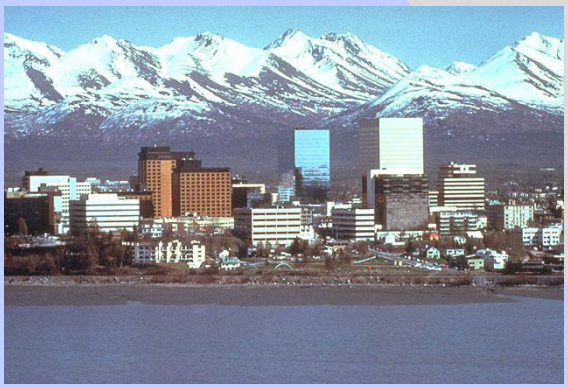
†Purchasing-power parity; local price divided by price in United States ‡Average of New York, Chicago, Atlanta and San Francisco §Dollars per pound **Weighted average of prices in euro area ††Dollars per euro

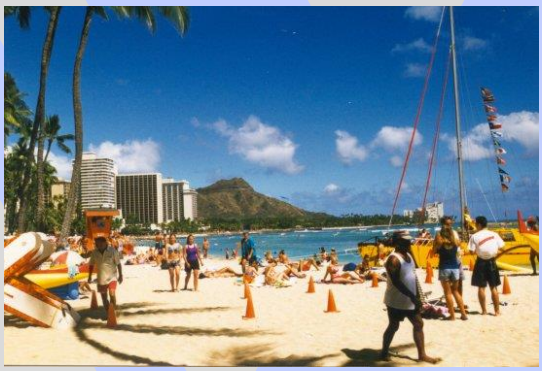
Sources: McDonald's; *The Economist*

7/5/07

www.bestplaces.net

- Los Angeles **100**
- Atlanta **62**
- Anchorage **108**
- Boston **83**
- Honolulu **109**
- San Francisco **113**





Absolute vs. Relative P-P-P

Absolute	Relative
$P_{US} = rP_{UK}$ where P = price level in US or UK and r = exchange rate ($/£)	$P_{US} = krP_{UK}$ where P = price level in US or UK, r = exchange rate ($/£), k = a constant over time
	<u>Note</u>: Absolute P-P-P implies k = 1

Relative PPP Formula

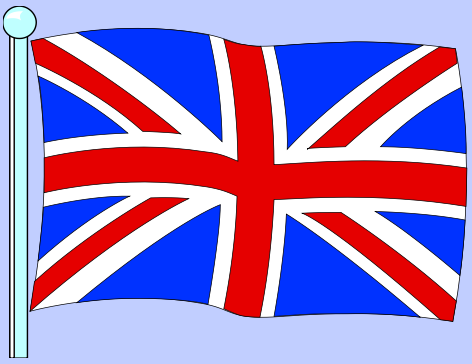
P_{US}/rP_{UK} = k in period 1 and period 2

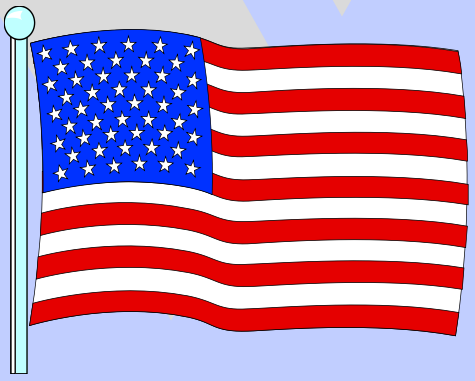
P_{US} in period 2 = P_{US} in period 1 times $(1+i_{US})$

where i_{US} = US inflation rate from period 1 to period 2

P_{UK} in period 2 = P_{UK} in period 1 times $(1+i_{UK})$

where i_{UK} = UK inflation rate from period 1 to period 2





Relative PPP Formula

Now solve for r_2/r_1 where

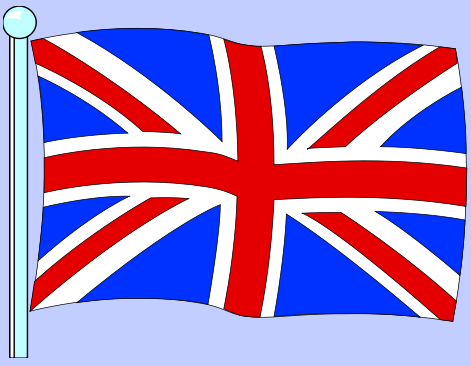
r_t = exchange rate ($/£) in period t = 1 or 2,

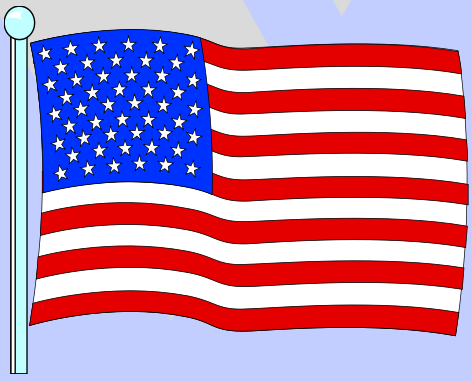
i_{US} = US inflation rate from period 1 to period 2,

i_{UK} = UK inflation rate from period 1 to period 2.

Result:

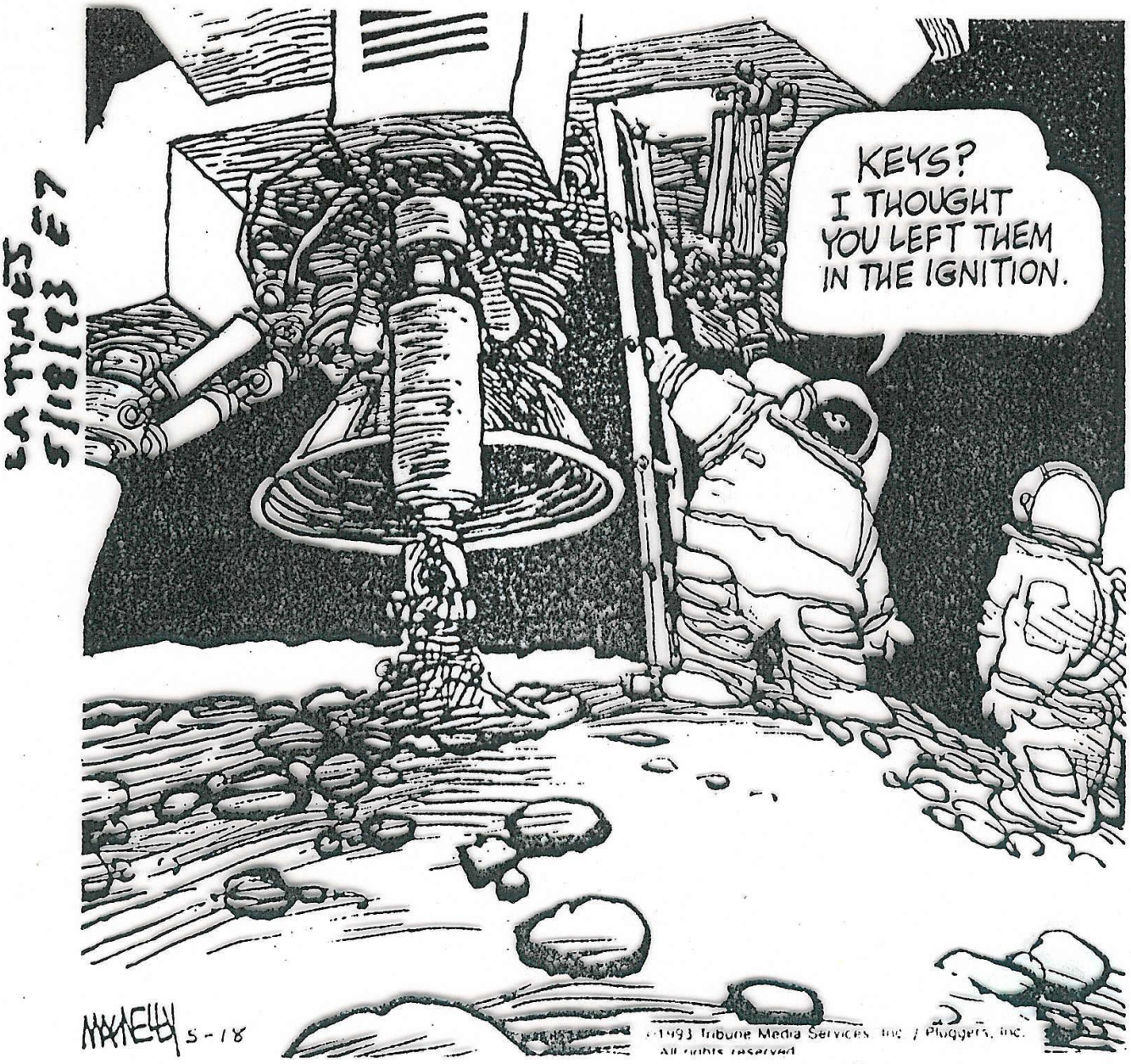
$$r_2/r_1 = (1+i_{US})/(1+i_{UK})$$





Remember

$$r_2/r_1 = (1+i_{US})/(1+i_{UK})$$



Relative PPP

Real World	Ricardian Model
■ Some non-traded goods	■ All goods traded
■ Many costs are reflected in prices	■ ULC = price (only labor costs)
■ Measurement problems present	■ No measurement problems
■ Capital movements	■ Exports = imports
■ Dynamic	■ Static

Voltaire

"One should always aim at being interesting rather than exact."

Exchange Rates: Some Lessons

- **Demand & supply of currency reflect demand & supply for goods (and assets).**
- **Elasticity conditions determine impact of exchange rate on trade balance.**
- **Low short-run elasticities produce the J curve effect.**
- **Empirically, devaluation leads to a deterioration of the terms of trade.**
- **Countries which inflate a lot relative to others experience a lot of depreciation of their currency.**

Price-Specie-Flow Mechanism:

3 Versions

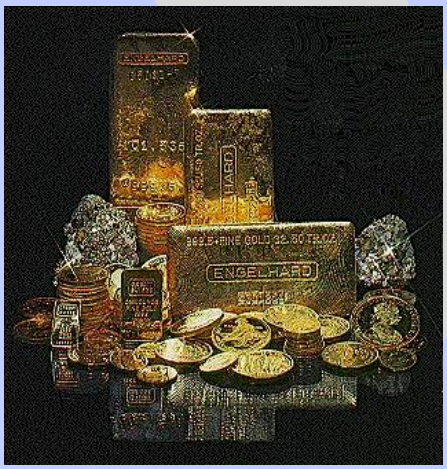
- **Oldest: All money = gold**

  David Hume (1711-1776)

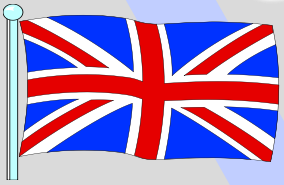
- **19th century gold standard: Money = currency & bank deposits**
- **Modern fixed exchange rate systems (without gold)**

Price-Specie-Flow Mechanism:
3 Versions

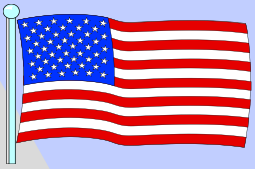
- **Oldest: All money = gold**
  - **David Hume (1711-1776)**
- **19th century gold standard: Money = currency & bank deposits**
- **Modern fixed exchange rate systems (without gold)**



Gold Standard:



Assumptions



- Two countries: U.S. and U.K.
- U.S. central bank: $400/oz. of gold
- U.K central bank: £200/oz. of gold
- Implicit “par value”: $2 = £1
- “Rules of the game”: ΔMoney/ΔGold > 0
- Both countries have “lots” of gold
- “Price level” = f(Money Supply)
- Full employment is maintained

Does par value become market value?

Suppose $2.10 = £1

Buy oz. of gold in U.S. ($400)

Ship gold to U.K.

Obtain £200

Convert £200 into dollars at $2.10 = £1

Obtain $420 ($20 is pure riskless "arbitrage" profit)

<u>Result</u>: Big demand for $s and big supply of £s.

Where does process end?

<u>End</u>: $2 = £1

Effect of Brokerage or Shipping Fees

Suppose transaction cost is $5 per oz.

What is gold export point?

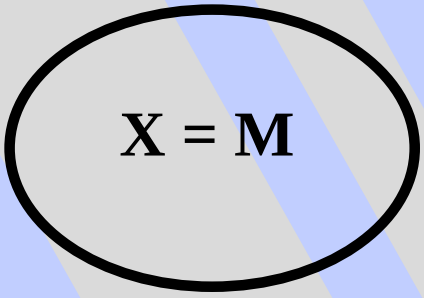
$405/£200 or $2.025/£

What is gold import point?

$395/£200 or $1.975/£

<u>Note</u>: A "band" of ±1.25% is created around the par value.

Example without capital movements

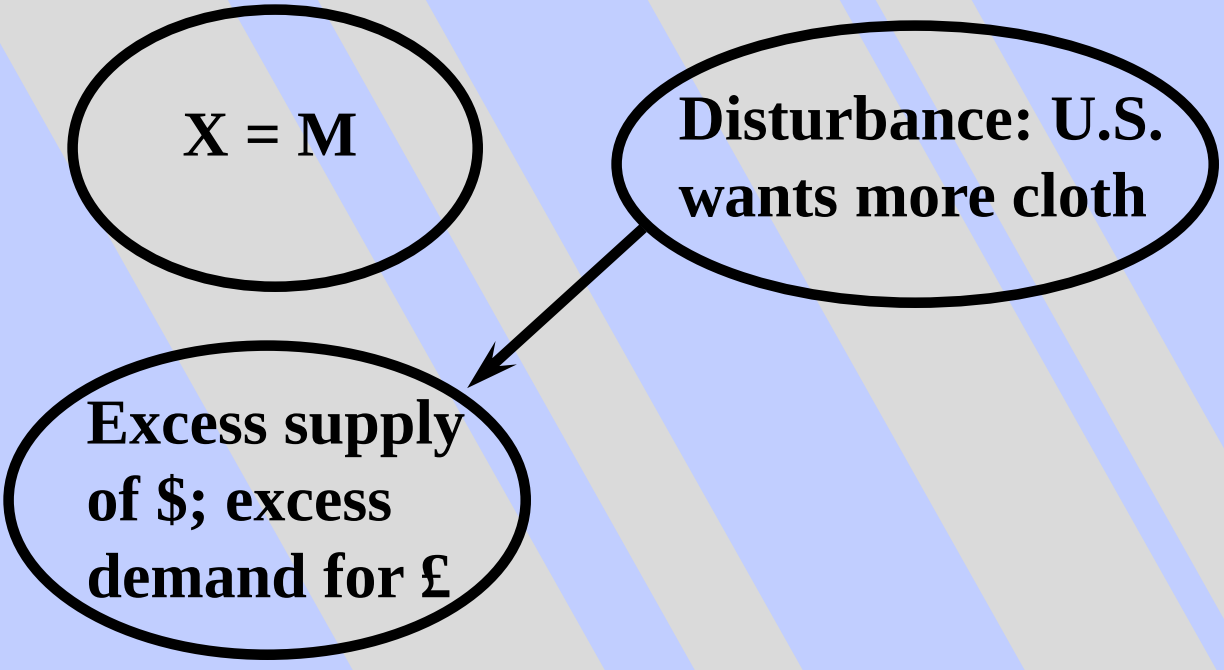


Example without capital movements

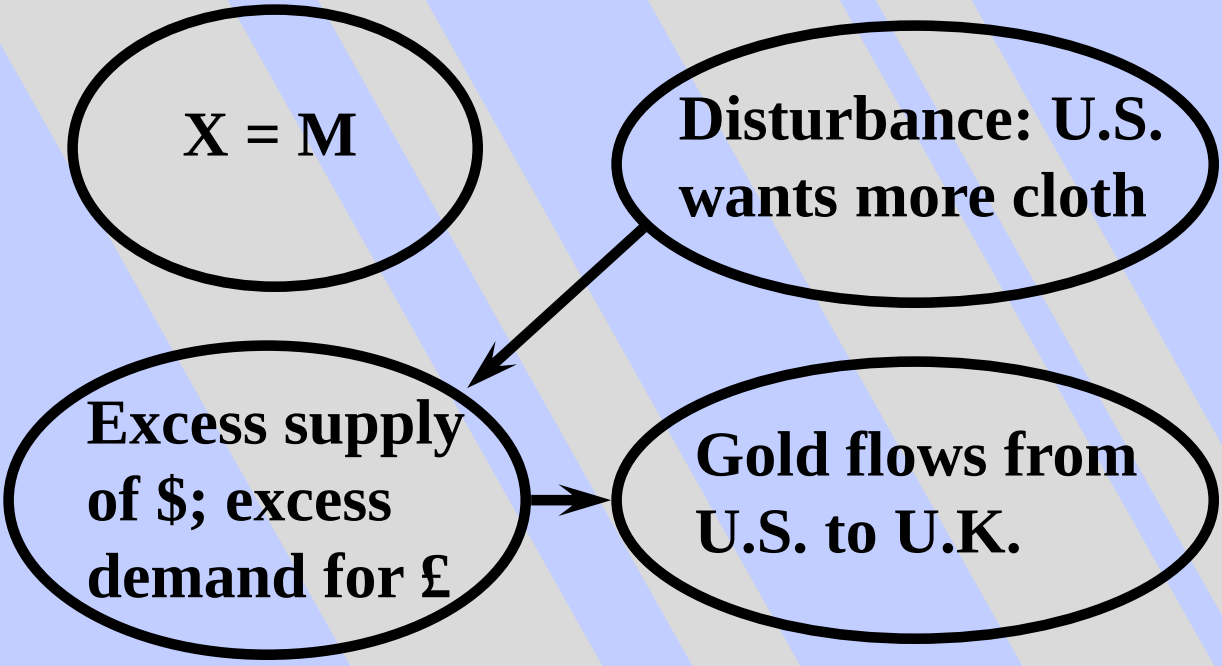
X = M

Disturbance: U.S. wants more cloth

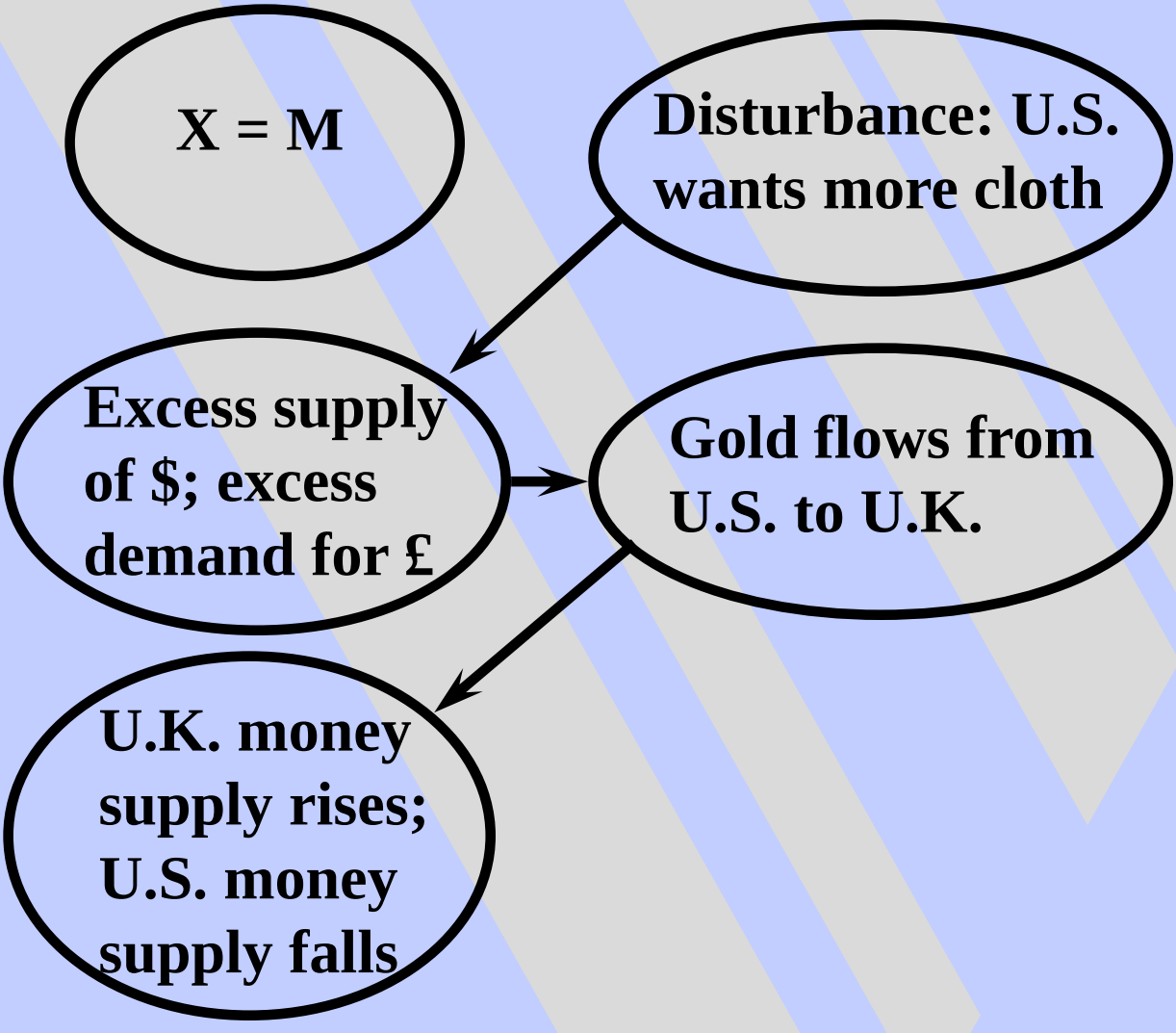
Example without capital movements



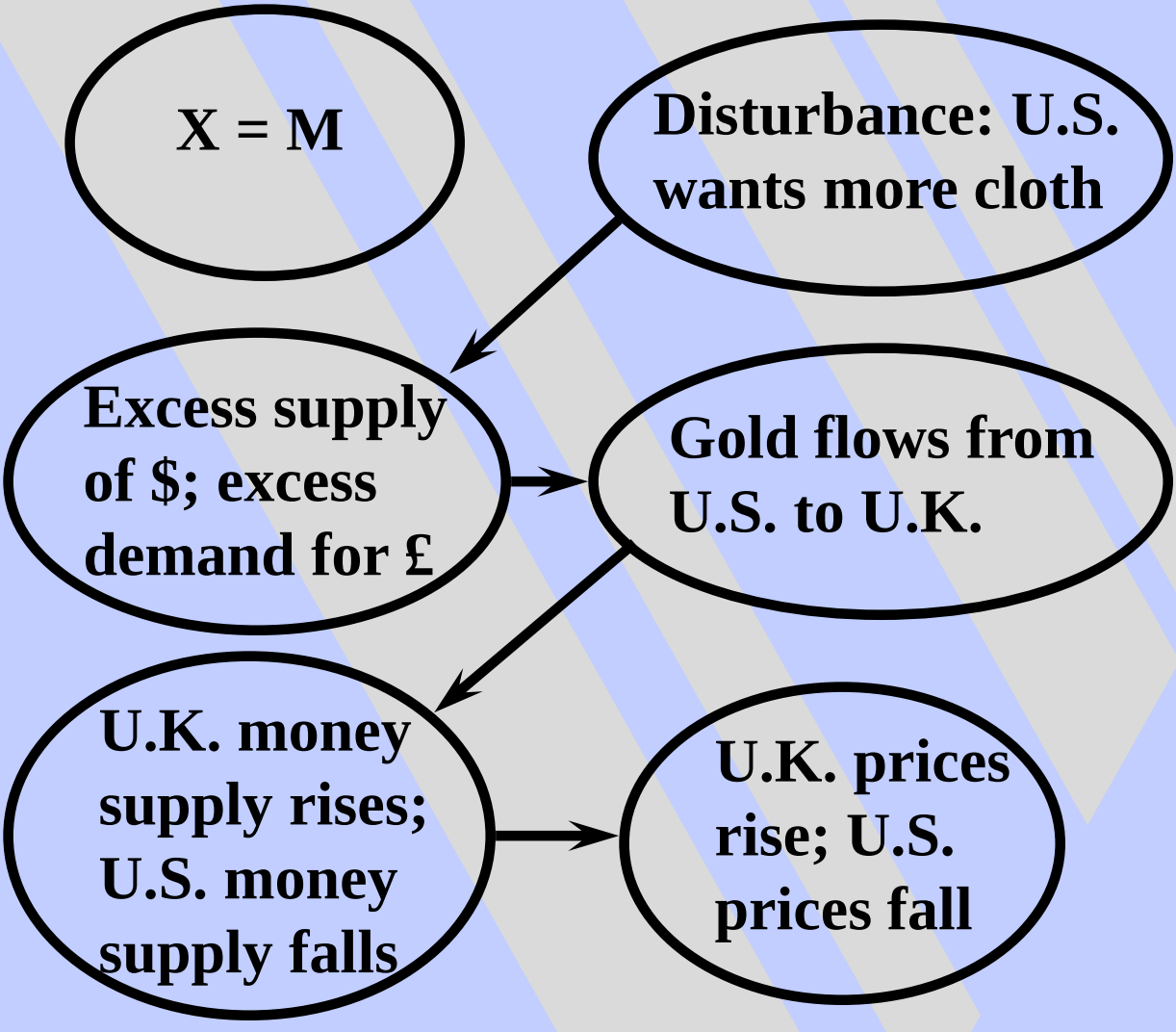
Example without capital movements



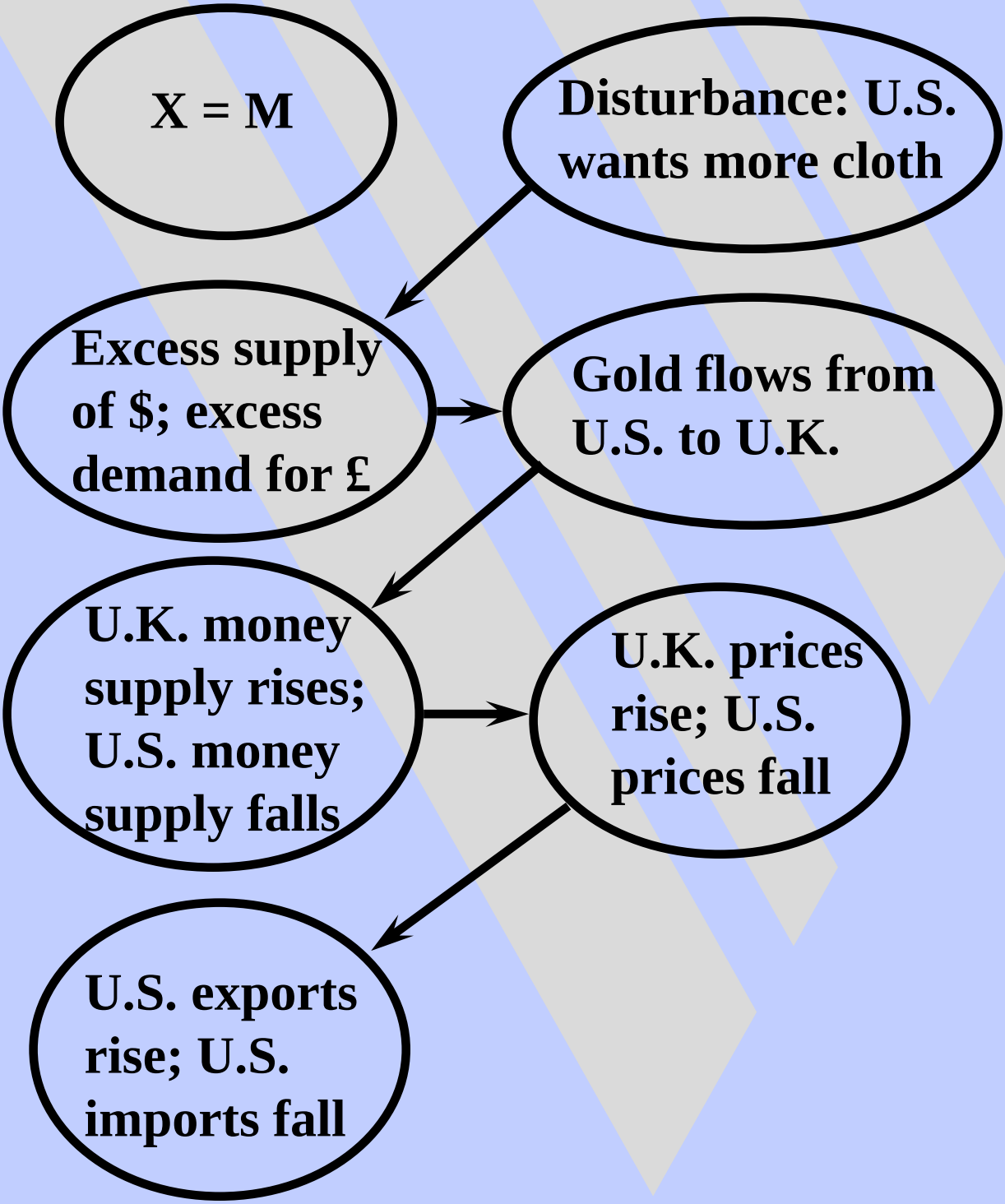
Example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply rises; U.S. money supply falls

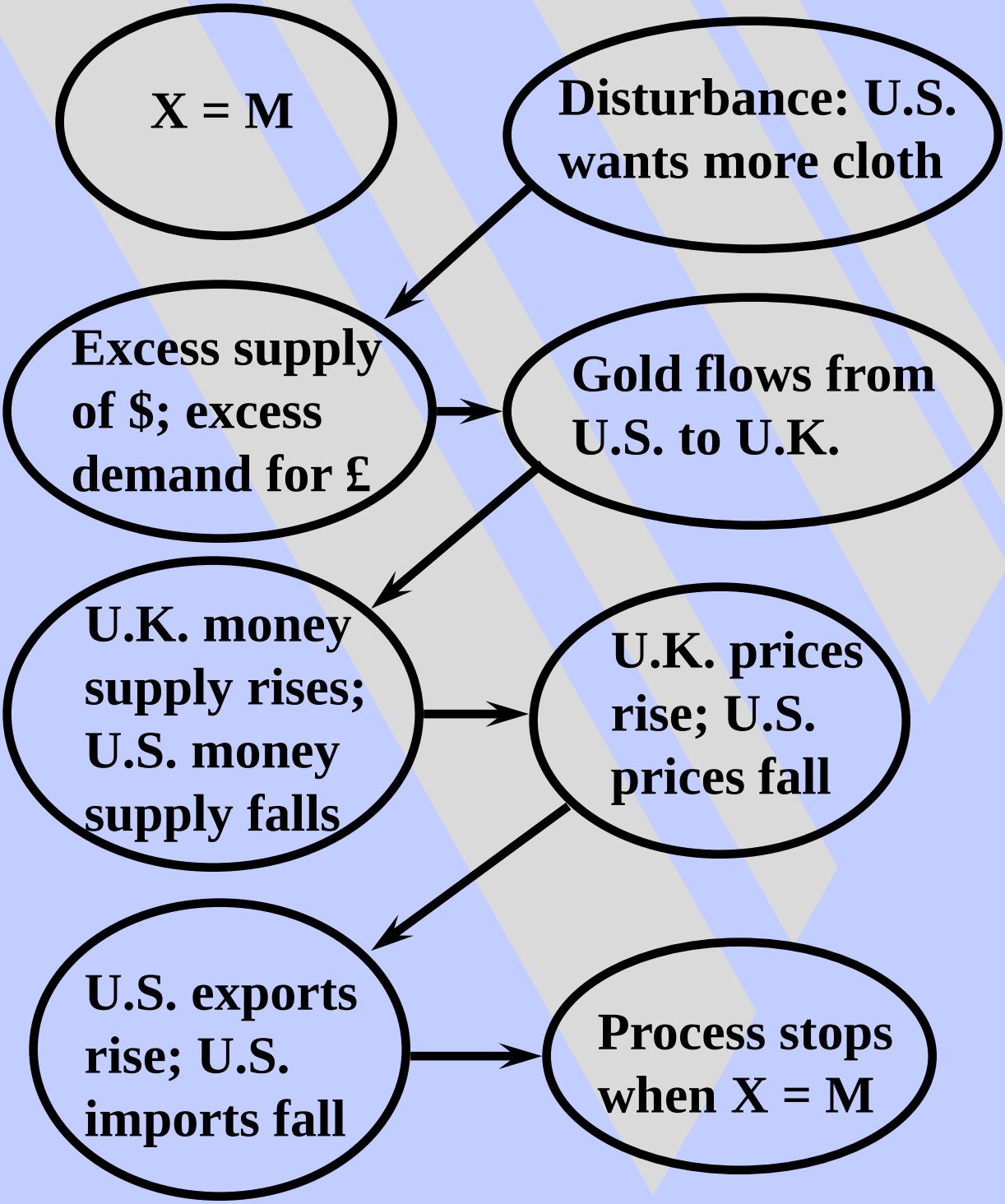
Example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply rises; U.S. money supply falls
U.K. prices rise; U.S. prices fall

Example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply rises; U.S. money supply falls
U.K. prices rise; U.S. prices fall
U.S. exports rise; U.S. imports fall

Example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply rises; U.S. money supply falls
U.K. prices rise; U.S. prices fall
U.S. exports rise; U.S. imports fall
Process stops when X = M

Other Cases:

- **Net investment from U.K. to U.S.**
- **U.K. violates rule of the game by "sterilizing" gold inflow (ΔMoney/ΔGold = 0)**
- **U.S. violates rule of the game by raising money supply exogenously ("exporting inflation")**

UK wants to invest $1 million/year in US in railroad stocks

UK wants to invest $1 million/year in US

Pre-investment:

US: X=M

In addition to imports from US, UK investors want $1 million of US RR stocks

Excess demand for $; excess supply of £

Gold flows from UK to US

US money supply rises; UK money supply falls

US prices rise; UK prices fall

US: exports fall and imports rise

Process stops when US X-M = -$1 million

Other Cases:

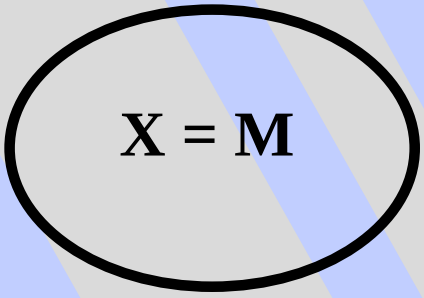
Net investment from U.K. to U.S.

U.K. violates rule of the game by "sterilizing" gold inflow (ΔMoney/ΔGold = 0)

Question: With U.K. violating the rules, can there be a full adjustment?

Question: What do we learn about the burden of adjustment?

First example without capital movements

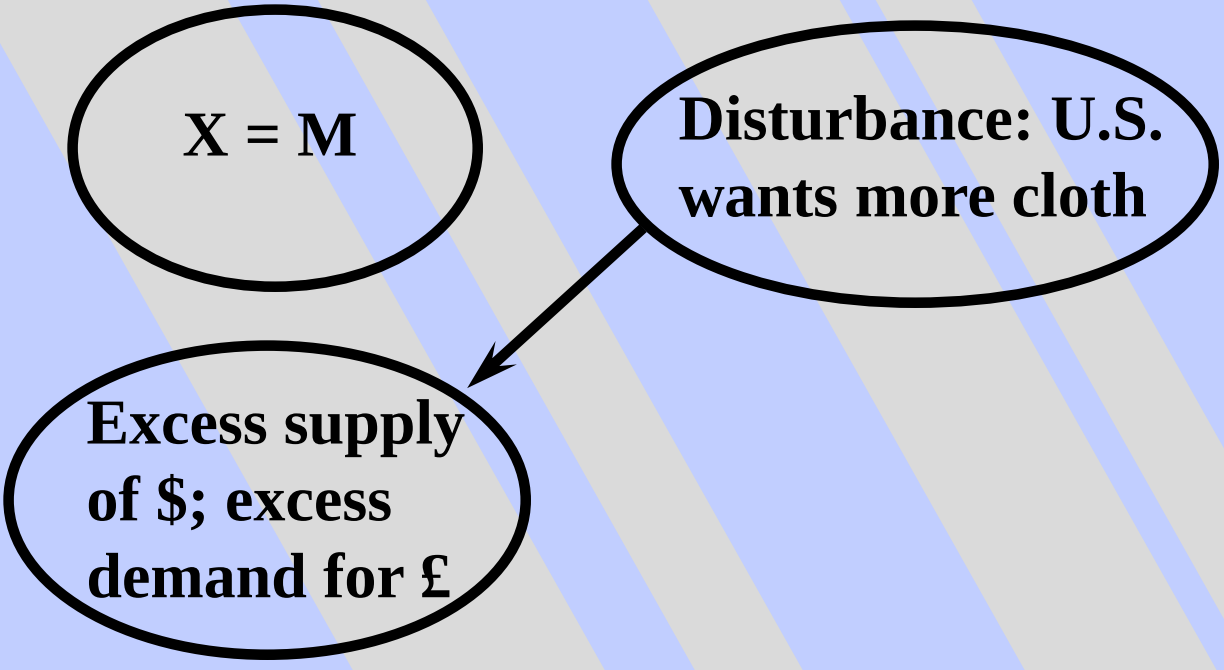


First example without capital movements

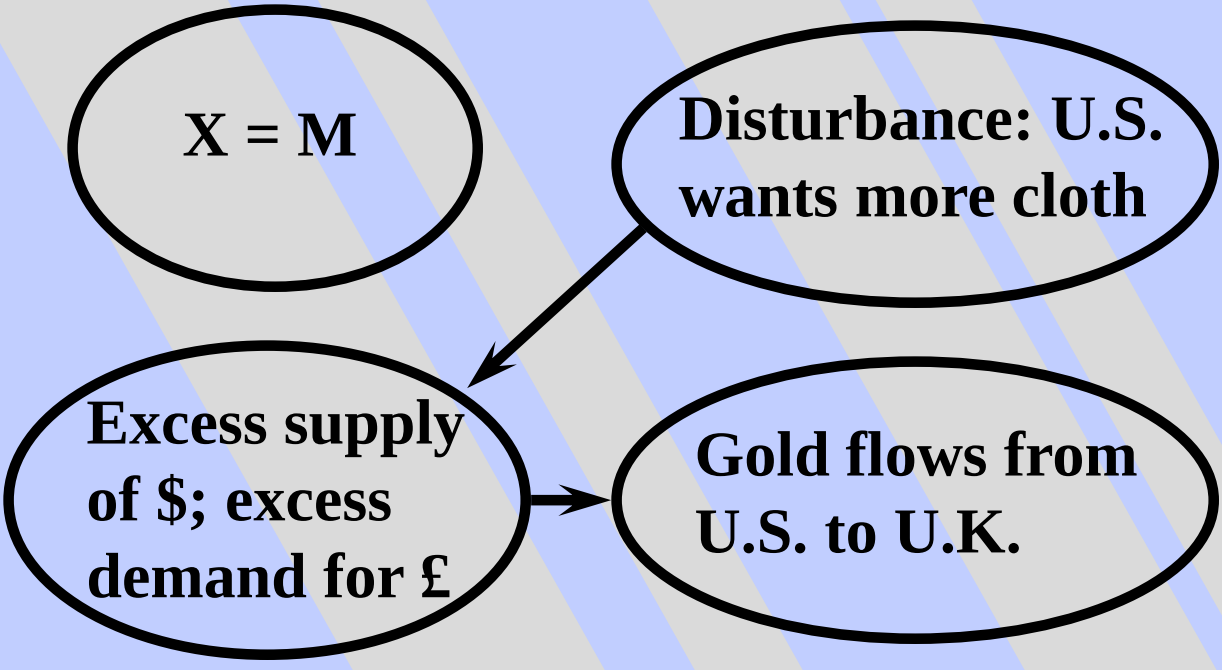
X = M

Disturbance: U.S. wants more cloth

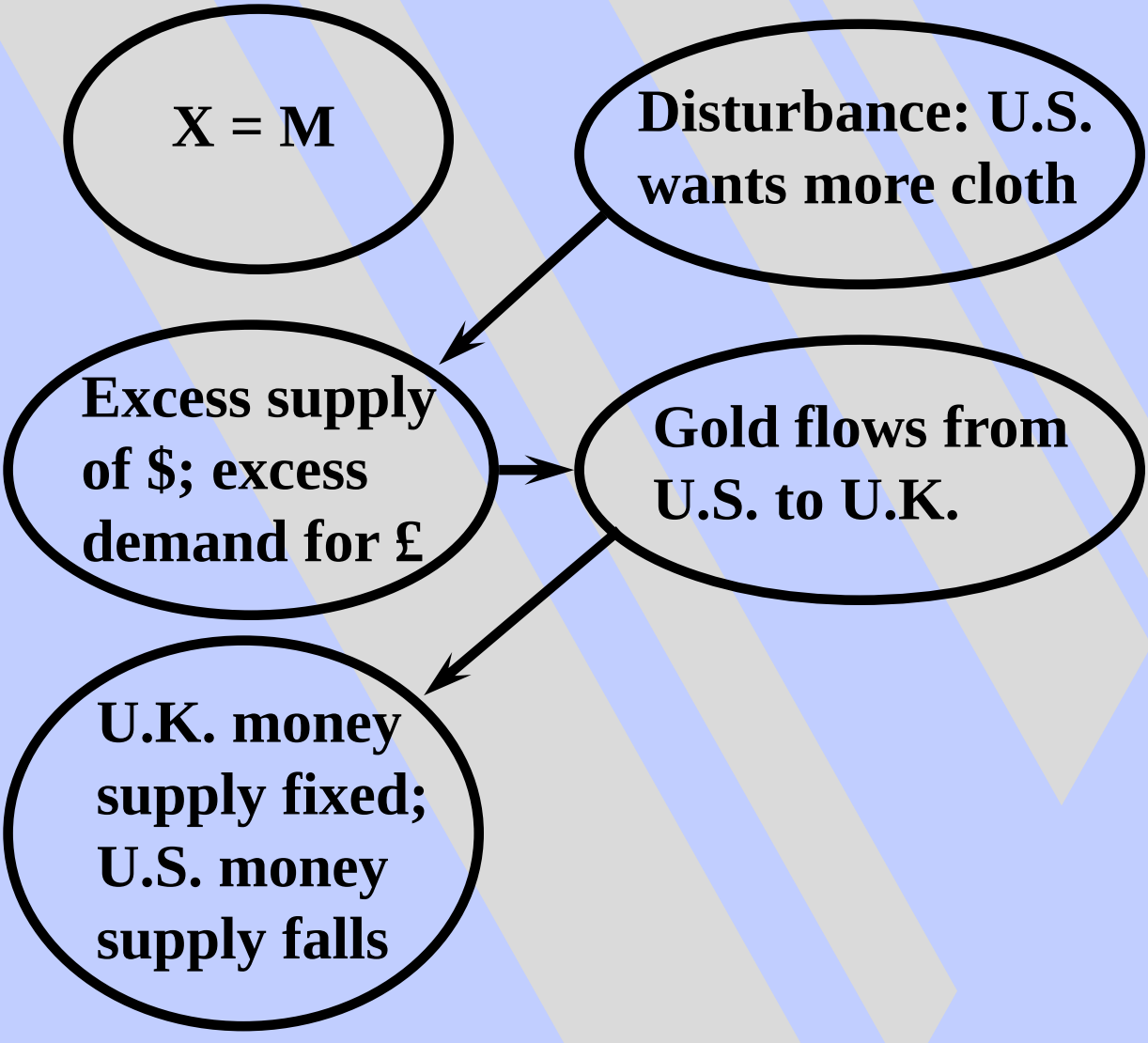
First example without capital movements



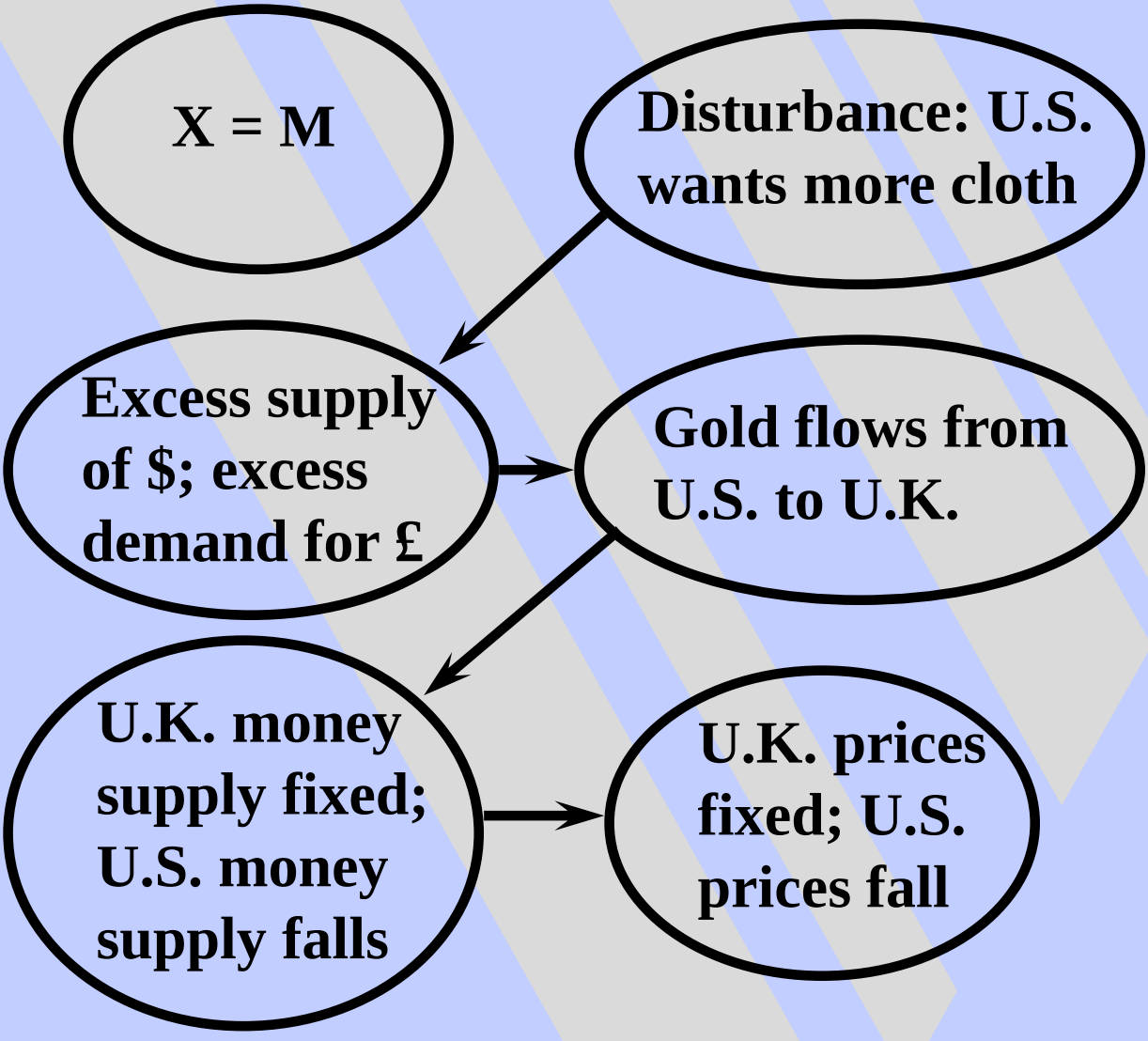
First example without capital movements



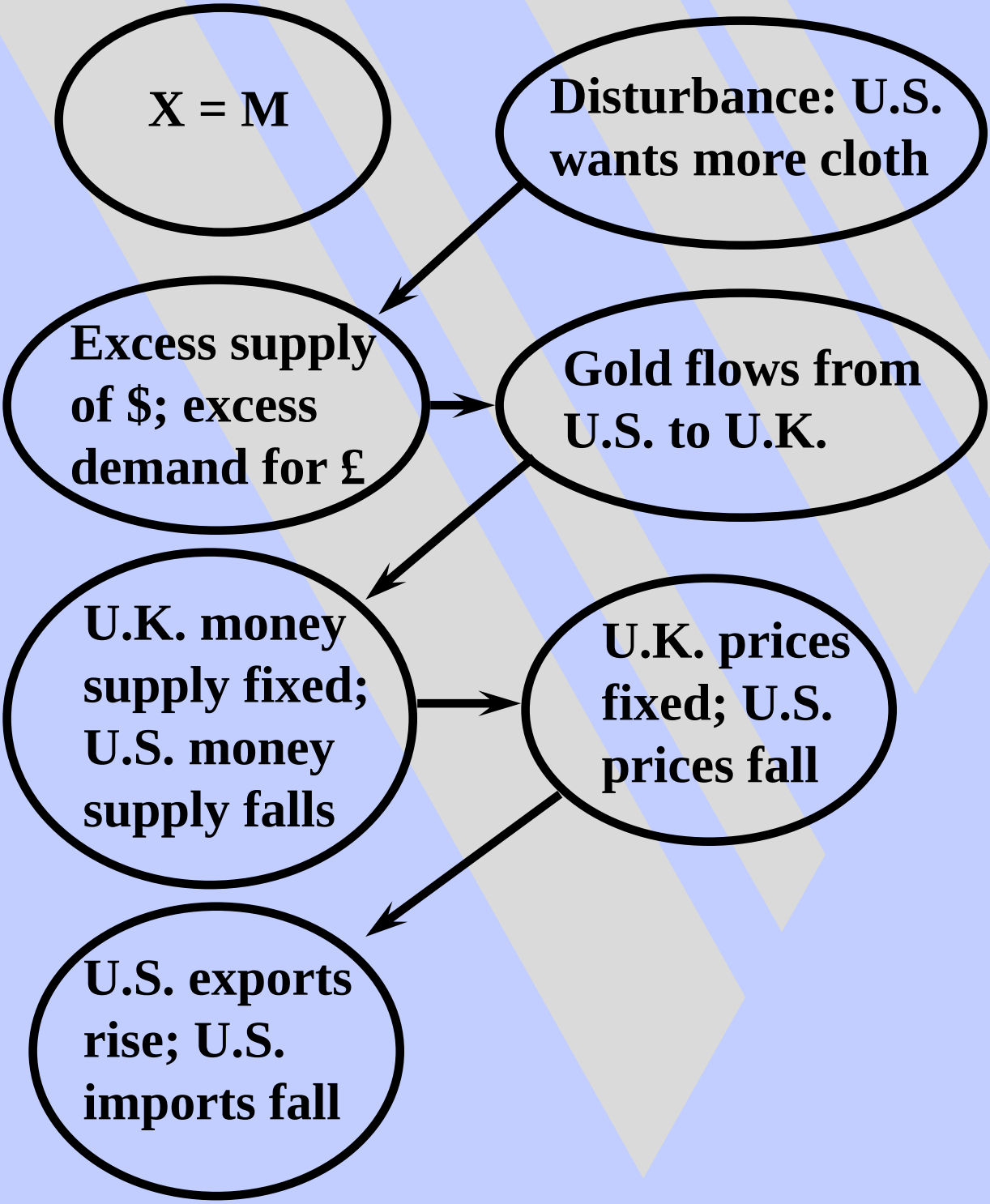
First example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply fixed; U.S. money supply falls

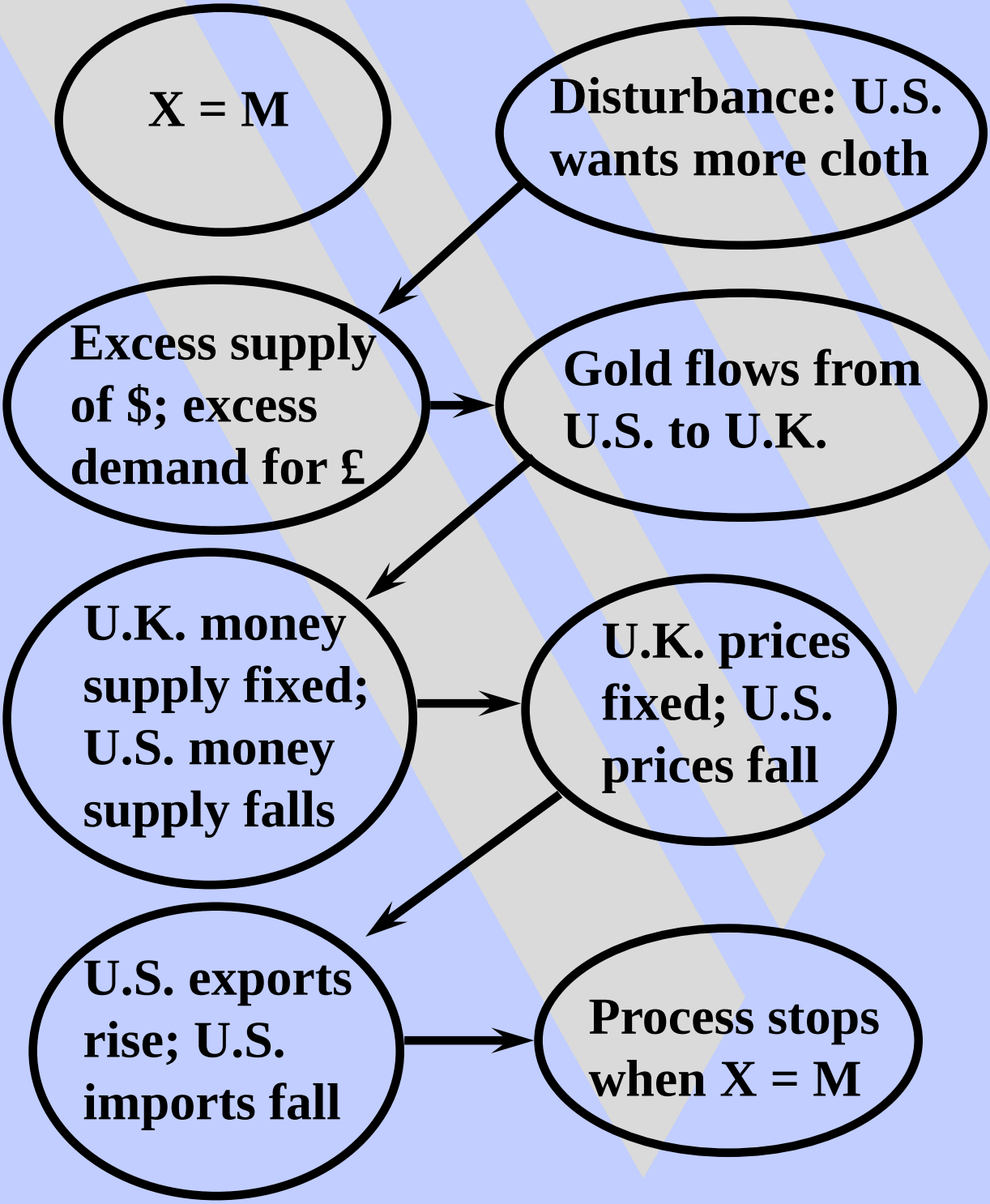
First example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply fixed; U.S. money supply falls
U.K. prices fixed; U.S. prices fall

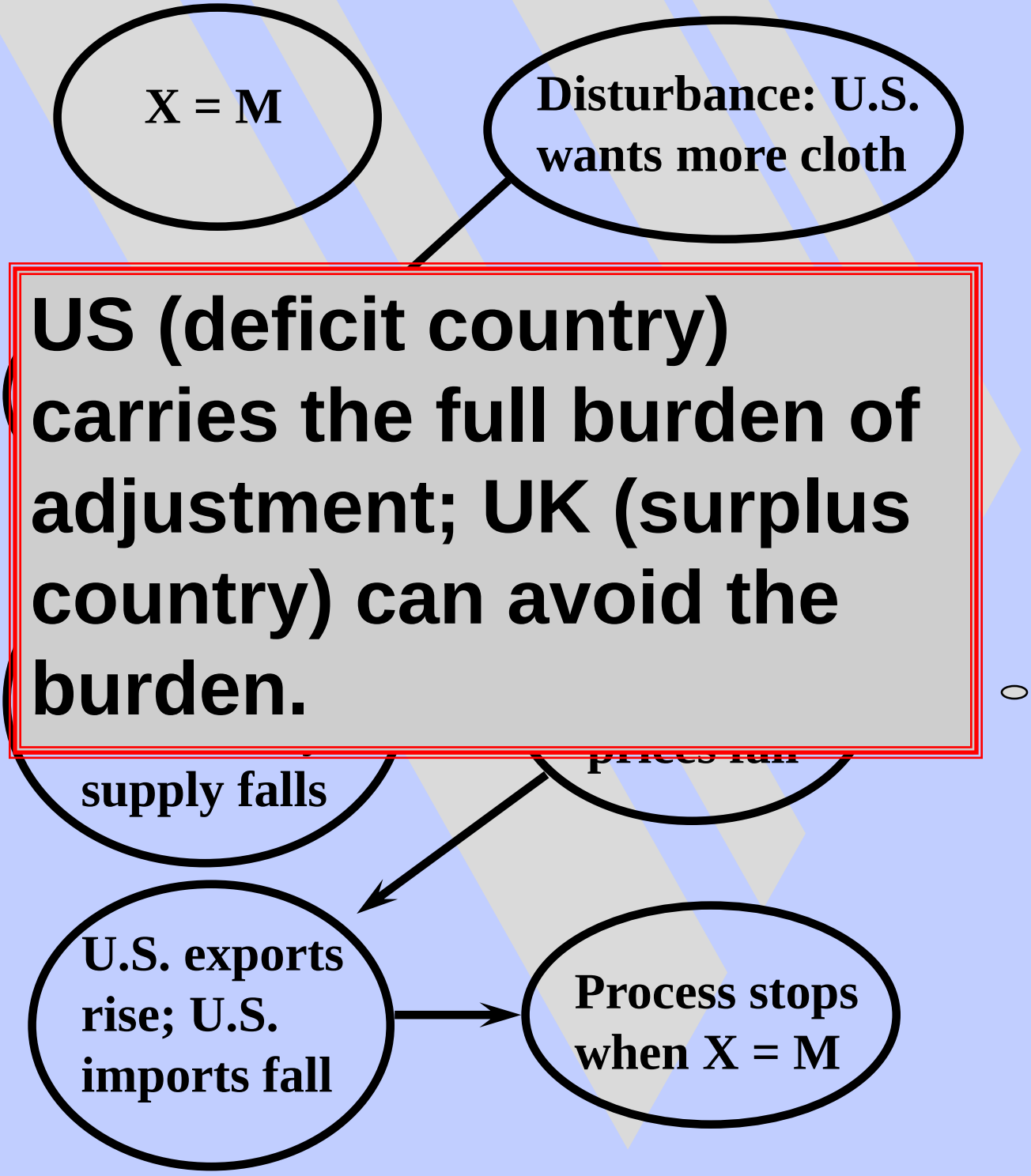
First example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply fixed; U.S. money supply falls
U.K. prices fixed; U.S. prices fall
U.S. exports rise; U.S. imports fall

First example without capital movements


X = M
Disturbance: U.S. wants more cloth
Excess supply of $; excess demand for £
Gold flows from U.S. to U.K.
U.K. money supply fixed; U.S. money supply falls
U.K. prices fixed; U.S. prices fall
U.S. exports rise; U.S. imports fall
Process stops when X = M

First example without capital movements


X = M
Disturbance: U.S. wants more cloth
US (deficit country) carries the full burden of adjustment; UK (surplus country) can avoid the burden.
supply falls
U.S. exports rise; U.S. imports fall
Process stops when X = M

Exporting Inflation Case

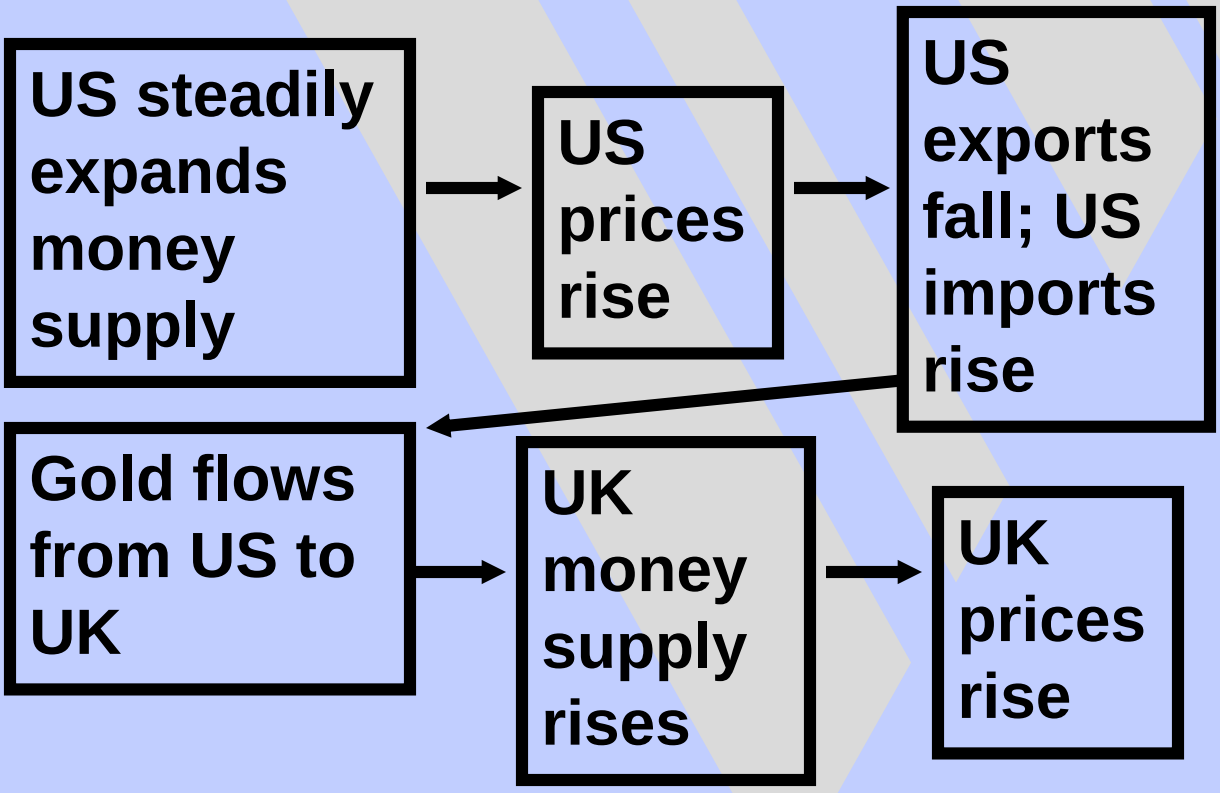
Fixed Exchange Rates

versus

Flexible Exchange Rates

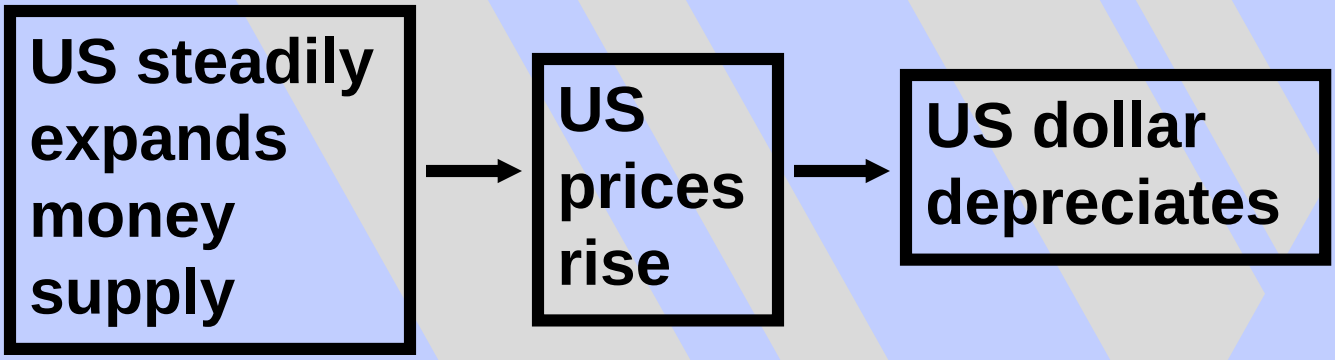
Exporting Inflation Case

Fixed Exchange Rates


US steadily expands money supply
US prices rise
US exports fall; US imports rise
Gold flows from US to UK
UK money supply rises
UK prices rise

Eventually, the US runs out of gold

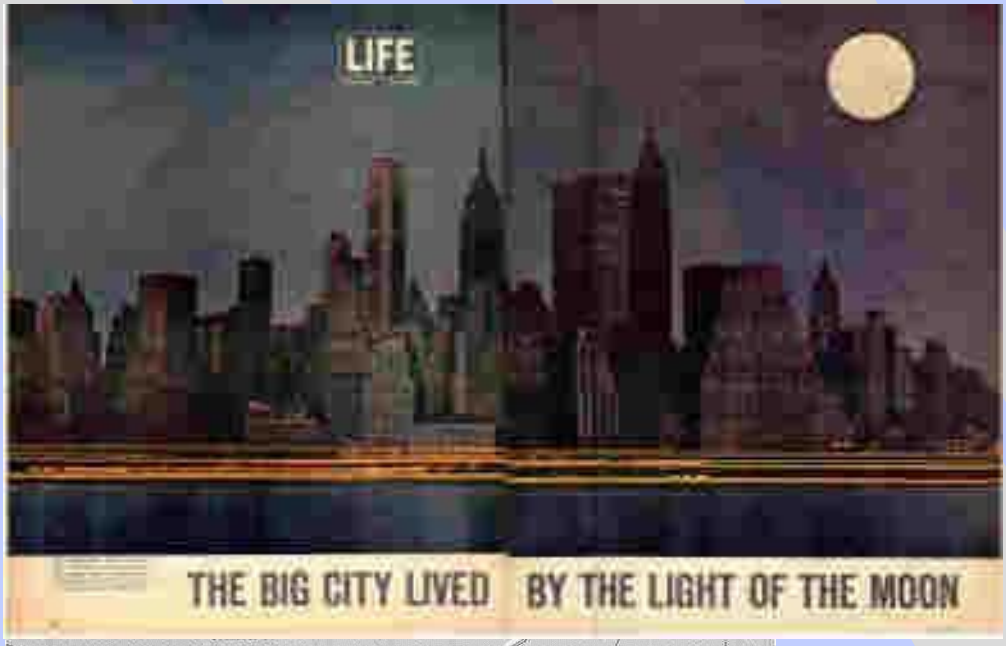
(Non) Exporting of Inflation Case



Flexible Exchange Rates

UK is largely unaffected

Electricity Grids and Fixed Exchange Rates



Northeast blackout: Nov. 9, 1965

In any system in which segments are tightly tied together, a disturbance in one segment is quickly transmitted to the other segments.

Modern Fixed Exchange Rates (without gold): An Example

- U.S. and U.K. agree to a particular fixed exchange rate as the par value between $ and £.
- Each agrees to buy or sell the other's currency at agreed rate with small bands around par.
- Rules of the game:
  - If your country is gaining reserves of the other currency, follow a "loose" monetary policy.
  - If your country is losing reserves of the other currency, follow a "tight" monetary policy.

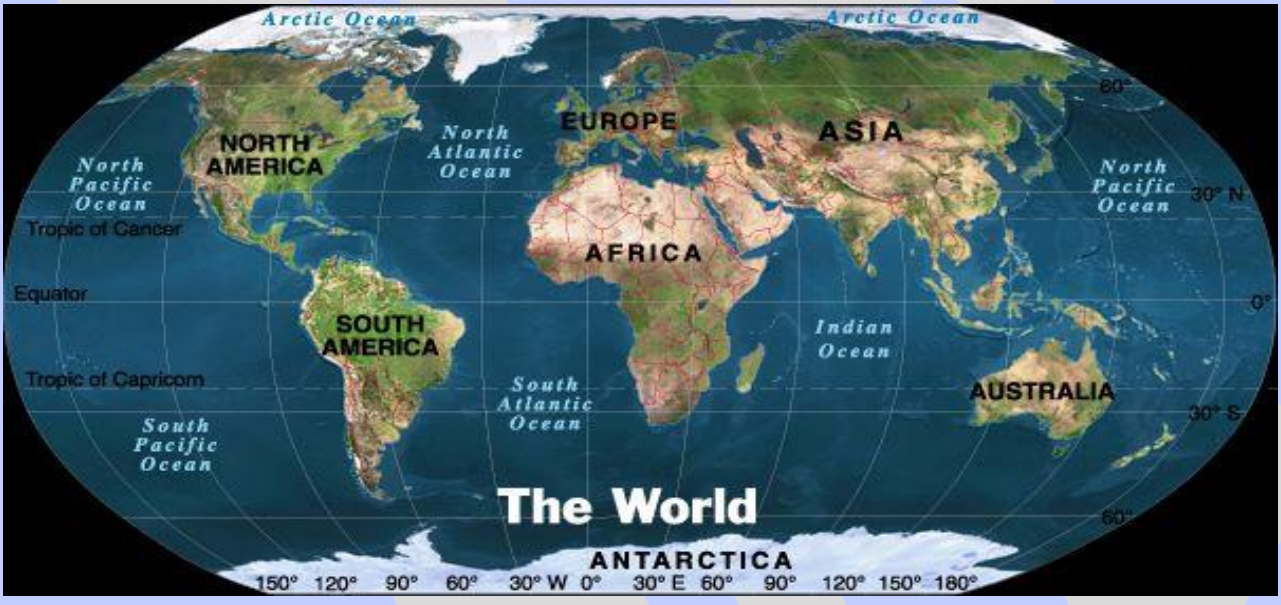
Fixed Exchange Rates: Lessons

- **Par value = market value (with transactions cost band or agreed band).**
- **Excess supply of (demand for) our currency means we lose (gain) gold under a gold standard.**
- **Rules of game necessary for long-term equilibrium.**
- **Under gold standard, rules are geared to gold flows; under modern system rules are geared to reserve flows.**

Fixed Exchange Rates: Lessons -- continued

- In a one-player situation, the player carries the entire burden of adjustment.
- Countries can export inflation if they inflate for domestic reasons (and ignore rules of the game).
- In contrast, flexible exchange rates tend to isolate domestic inflation.
- With fixed or flexible system, net capital inflow ==> imports > exports.
- Gold is unnecessary for a fixed exchange rate system.

MGT. 205A



Daniel J.B. Mitchell

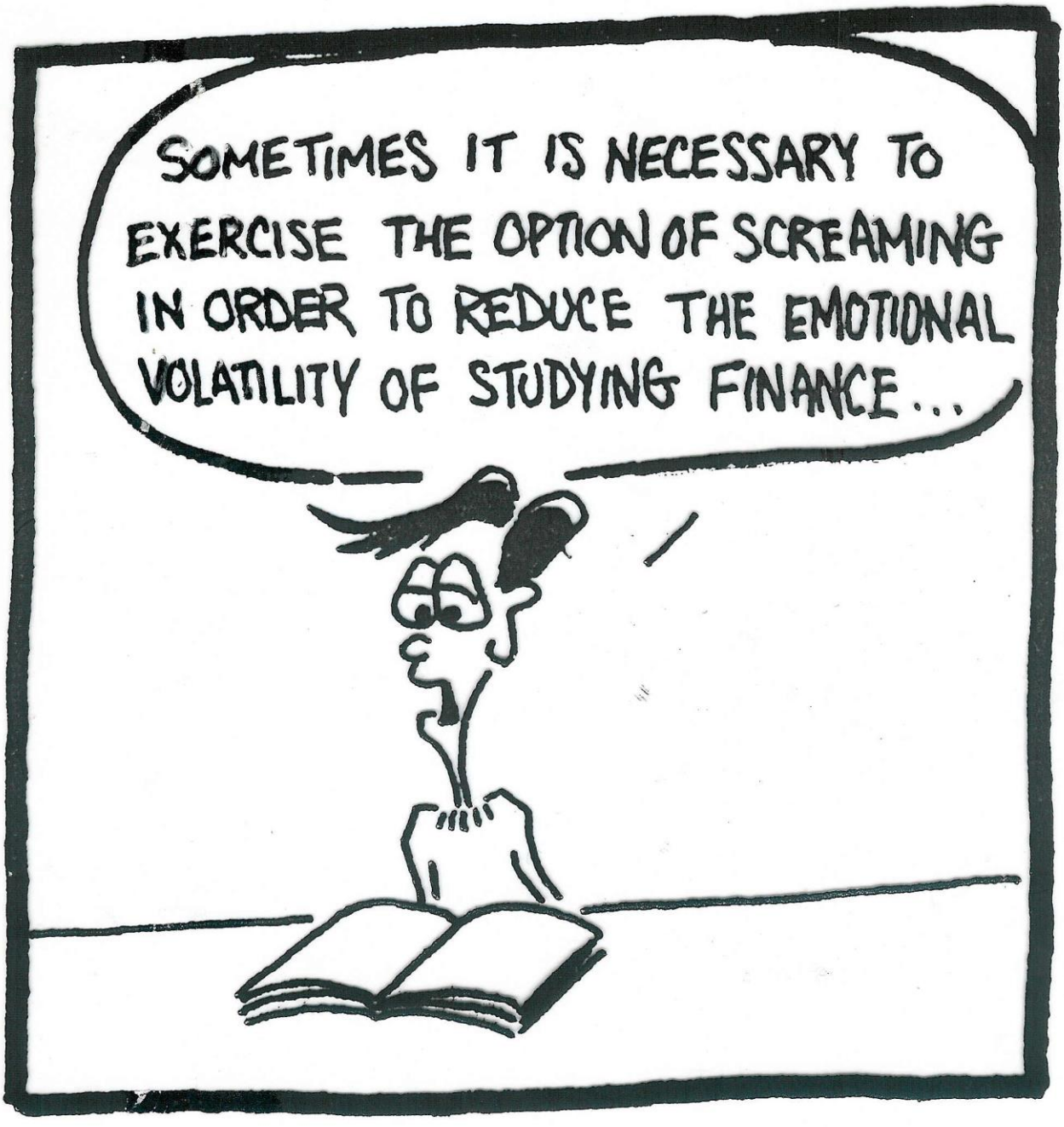
Ho-su Wu Professor

Anderson School

and

School of Public Affairs

Buy Low; Sell High


SOMETIMES IT IS NECESSARY TO EXERCISE THE OPTION OF SCREAMING IN ORDER TO REDUCE THE EMOTIONAL VOLATILITY OF STUDYING FINANCE...

Foreign Exchange Market Terminology

Speculation:

Risk taking based on forecasts (which may prove incorrect) about exchange rates.

Foreign Exchange Market Terminology

Speculation:

I am taking a *long* position on a currency if my assets in it > my liabilities in it.

Foreign Exchange Market Terminology

Speculation:

I am taking a *short* position on a currency if my assets in it < my liabilities in it.

Foreign Exchange Market Terminology

Arbitrage:

No risk profits based on price discrepancies between markets.